THE IRON TRADE REVIEW

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TREMENDOUS

DEMAND FOR STEEL RAILS FOR 1906 DELIVERY BREAKS ALL RECORDS.

Heavy Orders for Cars—Advance in Structural Material—Plates are Strong and Advance Expected.

Sales of rails since the price of $28.00 for 1906 delivery was announced last week have been tremendous, breaking all records and furnishing substantial evidence of very great prosperity in the iron business, present and prospective.

All Railmakers Represented.

It is estimated that the orders for rails for 1906 placed within a week will amount to 650,000 tons, and orders for several hundred thousand tons are pending. Although the United States Steel Corporation has booked very large orders, it has not alone enjoyed the unexpectedly heavy business from the railroads. The Colorado Fuel & Iron Co. reports its entire rail output sold for the year 1906, and the Tennessee Coal, Iron & Railroad Co., the Lackawanna Steel Co. and other interests are well supplied with orders. Among the bookings of the past week were the following; C. & N. W., 70,000 tons; Burlington, 50,000; Santa Fe, 50,000; Milwaukee & St. Paul, 65,000; Wisconsin Central, 22,000; Great Northern, 40,000.

Cars and Locomotives.

Accompanying the orders for rails are many orders for cars and locomotives. The Pennsylvania system has ordered 15,000 steel cars. Other railroads have bought liberally, and inquiries for at least 75,000 steel and wooden cars are pending. There is also a very brisk demand for track material.

Advance in Shapes.

The announcement of an advance of $2.00 per ton on structural shapes, although not expected, is received by the trade as being justified by market conditions. As the mills are supplied with orders whch will keep them busy for the remainder of the current year, the immediate effect on the market will be only the influence on buyers about to cover for their requirements for the first quarter of 1906, for which period order books are now open. Orders for over 20,000 tons of structural steel were placed at Chicago last week.

Improvement in Pig Iron.

The market for pig iron is rather quiet, but in nearly all selling centers there is an improved tone. It has developed that the first order for Bessemer placed recently by the United States Steel Corporation was for 15,000 tons at $14.50, and that a subsquent order was placed at $15.00, as, in a period of about 10 days between the placing of the two orders, furnace interests had become firmer in their views and more confident of their ability to sell at higher prices. Although the purchase of the Corporation was smaller than was expected, there seems to be no doubt that it will place further orders at an early day. The market for Bessemer and basic is considerably stronger, with $15.00 as the ruling price. The tendency of prices for foundry iron is upward, but the demand has not been very strong, and there are no important changes in quotations. Inquiries at Chicago and New York are numerous and for considerable tonnages. Among the sales made within a few days were 9,000 tons of gray forge at $14.65, Pittsburg.

Plates and Bars Active.

The demand for plates and steel bars continues very strong, and the trade would not be surprised to hear of an advance on these products at an early day. The American Shipbuilding Co. has placed contracts for plates for three large freighters, and additional contracts are pending.

Poor Car Service.

There is already considerable complaint about car shortage. This is especially true concerning coke, for which the demand has become so strong that the railroads are finding it difficult to give prompt shipments. Some jobbing interests also complain that they cannot get cars promptly.

NEW BLAST FURNACE CAPACITY.

Announcement of Improvement by the Illinois Steel Co.—Seven Open Hearth Furnaces.

CHICAGO, Sept. 5.—The announcement is made that the Illinois Steel Co. will build a blast furnace of 400 tons daily capacity and seven additional 50-ton open-hearth furnaces at South Chicago. Contracts will be let and work on the improvements commenced as soon as the plans under preparation have been drawn up. The company already has in operation at this plant 10 blast furnaces with an output of 110,000 tons of pig iron per month, and 17 open-hearth furnaces with a monthly output of 40,000 tons. The additions, which have been made necessary by large increases to the finishing mills at Joliet and South Chicago, will give when completed an output in round figures of 125,000 tons of pig iron per month, and 60,000 tons of open-hearth steel. The open-hearth furnaces will be duplicates of the seven that were built in conjunction with the structural mill, both of which were described in *The Iron Trade Review* some months ago.

Pickands, Brown & Co. have purchased 23½ acres of land on the Calumet river, between 108th and 109th streets, fronting the steel plant of the International Harvester Co., as the site for their furnace. The stack will be of modern type and with a capacity of 300 to 350 tons per day. A separate company will be organized to handle the project.

The Iroquois Furnace Co. has not yet decided on the location for its new furnace.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Advance in Structural Material—Heavy Business in Plates and Shapes.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, September 6.

The advance in prices of structural iron during the past week has been the only real live event, and this on account of its suddenness and unexpectedness came as a surprise, although conditions for a long time past have warranted the increase, had the makers cared to make the announcement. The parties to the agreement are now in position and books are open to contract for specifications at the new price to April 1, 1906, but sellers will not guarantee shipment. As things stand at the present time, there will be a large tonnage carried over into next year on existing contracts.

Makers of pig iron continue to feel optimistic, and although prices have advanced materially during the latter part of the summer, they are still anticipating still further increases. The feeling is good, stocks are being gone into pretty freely and, taken altogether, the situation is satisfactory to all concerned. Within the past ten days 9,000 tons of gray forge have been sold at a rate equal to $14.65, Pittsburg, and of this 4,000 tons came to Pittsburg district. One thousand four hundred tons of off malleable was brought into this district from Cleveland and in all a total of 10,400 tons went to four buyers, two of whom represented rolling mill interests, and one, 5,000 tons, the United States Cast Iron Pipe & Foundry Co. Most of the other sales, including stel making iron were, as far as can be learned, in small lots from 200 to 300 tons.

One of the brightest spots in the whole market is that presided over by the steel car companies. Since last Thursday the Pennsylvania railroad and Pennsylvania Co. have placed orders for 15,000 steel stock, gondola, hopper and box cars, dividing them among the various steel car companies, and the Erie railroad is out with specifications on which it intends to place not less than 5,000 steel freight cars and possibly double that number. A Southern railroad also wants steel cars. These orders will call for an immense amount of plate and structural iron and the shops are now filled with all the work they can take care of this year and this lot of cars, as well as those ordered from this time on, will have to be for next year's delivery. The Erie railroad, which already has a steel baggage car and a steel postal car, is now building a steel express car. The contracts placed within the past ten days for steel cars will take over 150,000 tons of plates and structural material.

The signing of the peace treaty between Russia and Japan at Portsmouth has been discussed in relation to its bearing on large exports of iron and steel from this country, and should this take place, the Pittsburg district will naturally take the lead. The situation in this quarter, however, is not looked upon as eagerly at the present time as it would be were domestic conditions not so bright. The export business is boomed during times of comparative lull in domestic markets, but at the present time the mills are running to capacity turning out material for domestic demands, and in many lines are from three to six months behind in deliveries. With these conditions, export business will of necessity consist only of the overflow.

Pig Iron.—While prices are firm and makers of pig iron are confident of big business and better prices, actual sales of steel making iron have been light as far as can be learned, and aside from the 10,400 tons of pig iron which went to rolling mill and pipe interests, the sales have been confined to comparatively small lots, although there are some fair sized inquiries out. Stocks are being drawn upon pretty freely, but the disposition toward heavy buying has not developed. We quote:

Bessemer, Valley	$14.75 to $15.00
Bessemer, Pittsburg	15.60 to 15.85
No. 1 Foundry, Pittsburg	15.90 to 16.20
No. 2 Foundry, Pittsburg	15.40 to 15.70
Gray Forge, Pittsburg	14.50 to 14.65
Basic, Valley	14.75 to 15.00
Basic, Pittsburg	15.60 to 15.85

Steel.—Steel billets and bars are scarce articles and as has been the case for some time past, open-hearth steel is hard to get. The rail mill of the Republic Iron & Steel Co., at Youngstown, last Sunday, changed from rails to billets after being on the former three or four weeks. The company's requirements for billets made the change necessary. Bars, long lengths, are quoted at $25 to $26, and cut bars at an advance of 50c. Bessemer billets are quoted at $24 and open hearth at $25.50. In merchant bars the prices are firm and the market is in as good condition as it has been at any time during the past two or three years. Makers are selling to July 1, 1906, mostly to agriculture implement makers.

Ferro-Manganese.—No sales of any magnitude have been reported, but dealers are holding firm at not less than $50 for 80 percent, and it has been quoted as high as $51.50.

Muck Bar.—Makers are filled up with about all they can take care of on contract, and there has not been much outside movement. The most recent quotation was $26.20, Youngstown, or $27.15, Pittsburg.

Skelp.—Bessemer grooved is quoted at 1.50c and sheared at 1.55c. Grooved iron is quoted at 1.55c and sheared at 1.60c to 1.65c.

Rails and Track Material.—The official announcement last week of the $28 price for standard section rails for 1906 delivery, while it had been expected, has had no effect on conditions and orders are being booked freely for next year's delivery and 1906, it is being predicted, will see the greatest output of steel rails in the history of the country. In addition to the new contracts, a large amount of tonnage will have to be carried over from this year on account of the inability of the mills to turn out the work, they now being crowded to capacity and will be until after the first of the year. The demand for light rails continues unabated. We quote:

Fifty pounds and 500 tons, $28; carload lots and less than 500 tons, $30; less than carload lots, $32; light rails, 16-lb., $29 to $30; 20-lb., $27.50 to $28; 25 to 45-lb., $26 to $29; angle bars for standard sections, $1.35c; spikes, 1.75c.

Plates.—Plates continue to hold their place among the strong features, although they were not included in the advance in prices of structural material. Orders have already been placed ahead for next year. The contracts for steel cars have resulted in placing large orders, for such plates are used in their construction. Although three ships have been announced as under contract at lake yards, further inquiries are out and further announcement of new ship construction may be expected at almost any time, outside of the reported figuring for new ships by the Pittsburg Steamship Co., the lake end of the United States Steel Corporation. Universal plate situation is very

strong and mills are so filled up that very few orders are being placed at less than 1.60c for narrow plates 14 in. and under. We quote:

Tank plates, ¼ in. thick, 6¼ in. to 14, inclusive, 1.50c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.60c. Extras are as follows per 100 lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive fire box, 50c; plates over 100 in. up to 110 in. in width, not less than 5c extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, 10c extra; gauges 7 and 8, 15c extra; No. 9, 25c extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except Pacific Coast.

Bars.—Despite the advance of $2 per ton in bar iron by one of the large producers considerable business has been placed. We quote:

Bar iron, 1.65c to 1.70c, Youngstown; hoops, 1.65c and bands, 1.50c; both taking hoops and bands extra, respectively. Bessemer steel bars, 1.50c; open hearth steel bars, 1.50c; plow and cultivator, 1.50c, net; channels, angles, zees and tees, under 3 in., 1.60c. The following differentials are maintained on steel: Less than 2,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Structural Material.—The advance of $2 per ton on structural material, aside from plates, while it came as a surprise, has been warranted by conditions and there has been no complaint, in fact, consumers are glad to get material at almost any price, considering the conditions, the mills being far behind on deliveries and will not make any promises, even at the advance. The leading interest is now ready to book contracts for specifications at the new price as far ahead as April 1, 1906. We quote:

Beams and channels up to 15 in., 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles, from 3 to 8 in., inclusive, 1.70c; universal and sheared plates 6¼ to 14 in., inclusive, 1.50c; over 14 in., 1.60c, base.

Sheets.—There is a decided improvement in this market and the prospect is that the leading interest within the next week will add several mills which have been idle for some time past. A meeting of representatives of the American Sheet & Tin Plate Co. was held in Pittsburg Tuesday, but the outcome was not announced, although it is known several idle mills will be started. Conditions are more prosperous than they have been for some time. We quote:

No. 30, 2.65c; No. 29, 2.55c; No. 28, 2.40c; No. 27, 2.30c; Nos. 25-26, 2.25c; Nos. 22-24, 2.20c; Nos. 17-21, 2.15c; Nos. 15-16, 2.10c; Nos. 13-14, 2.05c; Nos. 10-12, 2c. Galvanized, Nos. 10-11, 2.35c; Nos. 12-14, 2.45c; Nos. 15-16, 2.55c; Nos 17-21, 2.70c; Nos. 22-24, 2.85c; Nos. 25-26, 3.05c; No. 27, 3.25c; No. 28, 3.45c; No. 29, 3.70c; No. 30, 3.95c. Quotations f. o. b. Pittsburg, 30 days net, 2 percent off cash 10 days.

Wire and Wire Nails.—Reports from the manufacturers are that conditions are satisfactory, without much change, and that jobbers and dealers anticipate a good business this fall and winter, and are backing up this opinion by buying freely and conditions are all that could be expected for this time of the year. We quote:

Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, and less than carloads, $1.95; painted barb wire, $1.95 for jobbers in carloads; retailers' carloads, $2, and less than carloads, $2.10, with 30c for galvanizing. Annealed smooth fence wire is held at $1.65, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in 10 days. Iron and steel cut nails, $1.70 to $1.75.

Merchant Steel.—Makers are pretty well filled up to Jan. 1, and as a rule are not selling beyond that date except on tool steel, which does not vary materially in price. On the lower grades they are not quoting ahead of Jan. 1, in anticipation of better prices. We quote:

Cold rolled and ground shafting, 50 percent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.0c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.70c to 1.75c; toe calk, 2c to 2.05c.

Pipes and Tubes.—As reported last week, the leading interest is practically out of the market for the remainder of the year on large O. D. sizes. The demand for merchant pipe is good. While last month for the National Tube Co. was the largest August in its business, September has started out well, and the prospects are that former records will be surpassed for this month. Pittsburg basing discounts, which follow, are shaded about four points:

	Steel		Iron	
Carloads	Black	Galv.	Black	Galv.
⅛ and ¼ inch	68½	52½	66½	50½
⅜ and ½ inch	72½	60½	70½	58½
¾ to 6 inches	76½	66½	75	65
7 to 12 inches	71½	56½	70	54½
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong plain ends, ⅛ to 8 inches	56	45	54	43

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel	Iron
1 to 1½ inches	44	41
1¾ to 2¼ inches	56	41
2½ inches	58	46
2¾ to 5 inches	64	53
6 to 13 inches	56	41

Less than carloads, two points less.

Old Material.—Business in this market has slightly improved over last week and consumers have shown some disposition to buy, which has not been the case throughout the summer, most of the trading during that time being between dealers on speculation. The advance in steel making iron may have had a tendency to stiffen scrap. The Pennsylvania Co. and Pennsylvania railroad are both out with large lists this month. We quote: Heavy melting stock, $15.25 to $15.50; low phosphorus material, $17.50 to $18.50; rerolling rails, $14.75 to $15; cast scrap, $14.75 to $15.25; borings, $8.75 to $9.00; No. 1 wrought, $17 to $17.50.

Coke.—Gains have been made in both production and shipment in the Connellsville and lower Connellsville regions during the past two weeks. During the week ending Aug. 26, 1905, the gain was 10,000 tons, 8,000 for the Connellsville region and 2,000 for the lower Connellsville region, the figures bein 266,163 tons and 83,979 tons respectively for the week. As an evidence of the feeling of better things 700 ovens were fired during that time. For spot delivery $1.90 to $2.10 is quoted on furnace coke and $2.35 to $2.50 for foundry coke. As far as can be learned no actual business has been done extending into next year, although there have been quite a few inquiries out.

F. A. McCune, cashier of the Carnegie Steel Co., with offices in the Carnegie building, Pittsburg, has resigned, and W. I. Dithridge, formerly assistant cashier, has been appointed in his place. John W. Brandon, who has been attached to the office for several years, was appointed assistant cashier. The resignation of Mr. McCune is due to his desire to pay more attention to his interests in Robinson Bros., brokers. He has been with the Carnegie Steel Co. for 11 years.

CHICAGO.

Tremendous Tonnage of Steel Rails Sold for 1906 Delivery—Fourth New Furnace.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, September 6.

Three hundred thousand tons of rails are on the books of the local mill for next year's delivery, This enormous tonnage—representing one-half the output of the South Chicago plant—was closed up within one week; and there are enough inquiries pending to warrant the assumption that before the present week is ended, the Illinois Steel Co. will have sold its entire capacity for 1906. Never before has the company experienced such a tremendous volume of buying in such a short period, and it is looked upon as a significant indication of the conditions that are expected to prevail in the iron and steel trade next year. In other respects, the market was without noteworthy activity. All products continue in a highly prosperous condition, and confidence is expressed that those which have lagged, including wire, sheets and merchant pipe, will develop greater strength before the advent of cold weather. The advance of $2 a ton in structural steel occasioned no surprise, as mills had been asking premiums of this amount for some time. Bar iron has been moved up another $1 a ton, and is now quoted at 1.70c Chicago. The tightness of the local plate mill was increased by the contract of the American Shipbuilding Co. for 5,000 tons of plates placed last week. Further tonnage is expected from this source in the near future, the company having signed contracts recently for three more boats, making 17 freighters in all for delivery next year. Contracts for fully 75,000 steel and wooden cars are also pending, and with those that have already been ordered, there will be no lack of business for several months for steel casting and malleable plants, rolling mills and car works.

The erection of another blast furnace in the Chicago district has been decided upon, making four in all that will soon be under course of construction. This will be built by the Illinois Steel Co. at South Chicago, in conjunction with seven additional open-hearth furnaces of the 50-ton type.

Pig Iron.—Trading was of limited extent and volume last week. Some good sized inquiries came up, including 3,000 tons of No. 2 from an Indianapolis concern; 1,800 tons of No. 2 from Carpentersville, Ill.; 2,000 tons of gray forge from a local house, a basic inquiry, and the usual quota of smaller lots from scattering foundries, but none of the larger deals was put through. Standard Southern brands are held strongly in this market at $12 Birmingham, and the larger buyers are holding out for a better price. Some sales continue to be made on the basis of $11.75, but the offerings at this price are generally of a high phosphorus character. There is a decided scarcity of local iron, and but for the check held on Chicago producers by Valley furnaces, prices would soar far beyond the $16.50 basis. Valley irons have a $2.30 freight rate to Chicago, and at $14 furnace, they can be sold in this city at slightly below local prices. Lake Superior charcoal iron has been in good demand for the last two weeks, the low price at which it has been offered making it particularly attractive to malleable foundries. The price was advanced yesterday 50 cents a ton, and it is now quoted at $17, Chicago. Our quotations are as follows:

Lake Superior charcoal	$17.00 to 17.50
Northern Foundry No. 1	16.75 to 17.00
Northern Foundry No. 2	16.25 to 16.50
Northern Foundry No. 3	15.75 to 16.00
Northern Scotch Foundry	16.75 to 17.00
Ohio Strong Softeners No. 1	16.80 to 17.30
Ohio Strong Softeners No. 2	16.30 to 16.80
Southern Foundry No. 1	15.90 to 16.15
Southern Foundry No. 2	15.40 to 15.65
Southern Foundry No. 3	14.90 to 15.15
Southern Foundry No. 4	14.65 to 14.90
Southern No. 1 Soft	15.90 to 16.15
Southern No. 2 Soft	15.40 to 15.65
Southern Gray Forge	14.40 to 14.65
Southern Mottled	14.15 to 14.40
Southern Silveries (4 percent to 6 percent Silicon)	16.65 to 17.65
Jackson Co. Silveries (8 percent to 10 percent Silicon)	19.30 to 19.80
Alabama and Georgia Car Wheel	20.15
Malleable Bessemer	16.25 to 16.50
Basic Iron	16.65

Billets.—A great scarcity of billets prevails in this market. Only one mill is in position to give deliveries, and this is asking from two to six weeks' time on all orders. Prices are very firm, and forging billets, which are the only kind obtainable here, are quoted from $30 upwards, according to the desirability of the order. Outside mills will have to relieve the present stress, as the Illinois Steel Co. cannot be much of a factor in this market for several months. Its present surplus steel capacity will be consumed in supplying the new structural mill with ingots as soon as the latter is in operation, and until the seven additional open-hearth furnaces, authorized last week, are constructed, it will have practically no billet tonnage to offer in the open market. There is some inquiry for wire rods, but buying is of light order. Prices are firm at $30 Pittsburg.

Bars.—Insistent demand is felt for both iron and steel bars. The specifications for the latter are especially heavy, in many instances exceeding the output of mills. Prices of bar iron continue to strengthen, one local interest now asking 1.70c Chicago. Desirable business, however, can easily be placed at from $1 to $1.50 below this price. We quote carload lots, Chicago delivery, as follows: Bessemer and open-hearth bars and bands, 1.66½c, half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 1.81½c base, full extras. Hard steel angles, 1.60c. There is a brisk demand from store and prices are strong. We quote bar iron, 1.95c base, full extras; soft steel bars and bands, 1.85c to 1.90c base, half extras; soft steel angles, channels and tees, under 3 in., 1.95c to 2c; hoops, 2.20c base, full extras.

Sheets.—There is an excellent demand for all gauges of sheets, black and galvanized. Competition between the various mills is keen, resulting in much cutting of prices. Although our quotations are on the basis of $2.25 Pittsburg for No. 28, it is possible to buy at from $1 to $2 below this figure. We quote carload lots, mill shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9 and 10, 1.76½c; Nos. 11 and 12, 1.81½c; Nos. 13 and 14, 1.86½c; Nos. 15 and 16, 1.96½c. On box annealed, one pass cold rolled, we quote: Nos. 18 and 20, 2.16½c; Nos. 22 and 24, 2.21½c; Nos. 25 and 26, 2.26½c; No. 27, 2.31½c; No. 28, 2.41½c; No. 29, 2.51½c. We quote on lots from warehouse stocks as follows: No. 10, 2.10c to 2.15c; No. 12, 2.15c to 2.20c; No. 14, 2.20c to 2.25c; No. 16, 2.30c to 2.35c; Nos. 18 and 20, 2.45c to 2.50c; Nos. 22 and 24, 2.50c to 2.55c; No. 26, 2.55c to 2.70c; No. 27, 2.70c to 2.75c; No. 28, 2.80c to 2.85c; No. 29, 2.95c to 3c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12 and 14, 2.36½c; No. 16, 2.51½c; Nos. 18 and 20, 2.66½c; Nos. 22 and 24, 2.81½c; No. 26, 3.01½c; No. 27, 3.21½c; No. 28, 3.41½c; No. 29, 3.66½c. Jobbers' prices on small lots from store, are as follows: Nos. 10 to 14 inclusive, 3.05c; No. 16, 2.95c; Nos. 18 and 20, 3.05c; Nos. 22 and 24, 3.20c; No. 26, 3.45c; No. 27, 3.65c; No. 28, 3.90c; No. 29, 4.35c; No. 30, 4.80c.

Structural Steel.—An advance of $2 a ton went into ef-

fect Sept. 1, applying on all sizes and shapes. Some large contracts were closed up last week, involving over 20,000 tons of structural steel. The two largest of these, the National Bank of Commerce building requiring 6,900 tons, and the new addition to the department store of Marshall Field & Co. requiring 7,400 tons, went to the American Bridge Co. Local jobbers and fabricators are experiencing considerable difficulty in keeping their stocks complete, because of delinquent shipments from mills. We have revised our prices, and quote carload lots, mill shipments, Chicago delivery, as follows: Beams and channels 3 to 15 in., inclusive, 1.86½c; angles, 3 to 6 in., ¼ in. and heavier 1.86½c; angles larger than 6 in. on one or both legs, 1.96½c; beams larger than 15 in., 1.96½c; zees, 3 in. and over, 1.86½c; tees 3 in. and over 1.91½c, with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. We quote prices from store as follows: 2.20c to 2.30c for angles, beams and channels, base sizes, with 2.30c to 2.40c for 18, 20 and 24-in. beams; tees and zees, 2.25c to 2.35c. These prices are for either random lengths or cut to specifications in excess of 5 ft.

Plates.—The transaction of principal interest last week was the order placed with the corporation by the American Shipbuilding Co. for 5,000 tons of plates, for as quick delivery as can be given. Remarkably good business from other sources was enjoyed by jobbers and independent mills. Prices are very firm, but without change. We quote tank steel, ¼ in. and heavier, up to 100 in. wide, 1.76½c base Chicago; flange steel, 1.86½c base; marine steel, 1.96½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Jobbers report a good movement from local stocks with store prices firm. We quote on small lots as follows: Tank steel, ¼ in. and heavier, up to and including 72 in. wide, 2c to 2.10c; over 72 in. wide up to 100 in., 2.10c to 2.20c; over 100 in. wide, usual mill extras; 3-16 in. up to but not including 72 in. wide, 2.10c; 3-16 in., 72 in. wide, 2.35c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—Within one week, the local mill has placed rail orders on its books for delivery in 1906, aggregating 300,000 tons. These are divided as follows: C. & N. W., 70,000 tons; Burlington, 50,000 tons; Santa Fe, 50,000 tons; Milwaukee & St. Paul, 65,000 tons; Wisconsin Central, 22,000 tons; and the Great Northern, 40,000 tons. In addition there is an order pending for 40,000 tons from the Northern Pacific. Before another week is ended, the Illinois Steel Co. expects to have sold its entire rail output for next year. There has also been a good demand for light rails in the past week, one mill having closed an order for 3,000 tons, and three orders aggregating 4,000 tons in this period. The movement in track supplies is heavy, and it is impossible to get delivery this year on either spikes or bolts. We quote heavy sections in 500-ton lots, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $28.50; 16-lb. $27.50; 20-lb. $26.50; 25-lb. $25.50; 30, 35, 40 and 45-lb. sections, $24 to $24.50; all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill: angle bars, 1.50c to 1.55c; spikes, first quality, 1.75c to 1.80c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c, per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Steel.—Producers of the special grades listed below report a highly satisfactory condition. Their output for months ahead is taken and specifications are constantly in hand sufficient to run them the balance of the year. Prices are firm but without change. We quote carload lots, mill shipments, Chicago delivery, as follows: Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c to 2.40c; smooth finished machinery steel, 1.91½c; smooth finished tire, $1.86½c; plow steel, 2.20c and upwards, according to quality; toe calk steel, 2.21½c; railway spring, 1.86½c. Cold rolled shafting, 50 percent off in carload lots, and 45 percent in less than carload lots. Crucible tool steel, 6½ to 8c; special grades of tool steel, 13c and up.

Merchant Pipe.—No change is to be noted in the local situation. There is a good business, but prices are weak and of wide range. Discounts as high as 80 percent Pittsburg are offered on ¾ to 6-in. black steel pipe, and corresponding reductions on galvanized. For purposes of comparison, however, we continue to quote the card rates of the leading producer, which have never been officially changed, though they have not been adhered to for several weeks.

MERCHANT PIPE.

	Steel.		Iron.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¼ inches	65.85	49.85	63.85	47.85
⅜ to ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85

PLUGGED AND REAMED.

	Steel.		Iron.	
1 to 4 inches	71.35	61.35	69.85	59.85

EXTRA STRONG PIPE.

⅛ to ⅜ inches	58.85	46.85	56.85	44.85
½ to 4 inches	65.85	53.85	63.85	51.85
4½ to 8 inches	61.85	49.85	59.85	47.85

DOUBLE EXTRA STRONG PIPE.

½ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—There is no dimunition to be noted in the demand for boiler tubes. From all sources it is of excellent proportions and mills are hard pressed to keep up with their specifications. Prices are firm but without change. We quote carload lots, Chicago delivery, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1½ inches	40.35	37.35	53.00
1¾ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	
6 to 13 inches	52.35	37.35	Up to 4½ inches 50.50

Less than carload lots from store, as follows:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40	35	42½
1¾ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	30
2¾ to 5 inches, inclusive	60	47½	42½

Wire Products.—No cessation is noted in the demand for all kinds of wire products. Prices continue weak, and while the official schedule has not been changed, it is not being lived up to by any manufacturers. Current business is being booked at $2 a ton less than these prices, or on the basis of 1.70c Pitsburg for wire nails. In some quarters, it is reported that a greater concession than the foregoing is being offered, but same cannot be confirmed. We quote carload lots, mill shipments, Chicago delivery, as follows: Wire nails, $1.85; painted barb wire, $2; galvanized barb wire, $2.30; smooth annealed wire, $1.70; smooth galvanized wire, $2; polished staples, $1.95; galvanized staples, $2.25.

Coke.—With the approach of colder weather, an increased demand is in evidence. The car scarcity at Connellsville and Southern ovens is being felt in Chicago in the decreased shipments from those points prices are stronger and show a tendency to advance. We quote Connellsville furnace $2 ovens, and Connellsville foundry, $2.40 to $2.50 ovens. Wise county, W. Va., coke is selling at $4.60 to $4.75 Chicago.

Old Material.—Encouraged by the high prices asked by railroads for their scrap, local dealers are showing no disposition to recede from the position they have taken in their trading with consumers. Nor are they any too anx-

ious to sell at prevailing values, believing they will get still higher prices by holding their material a few months. The local market is very firm, and a further advance all along the line is expected at an early date. We quote gross tons, as follows:

Old steel rails (4 feet and over)	$14.25 to 14.50
Old steel rails (less than 4 feet)	14.00 to 14.50
Old iron rails	19.00 to 19.50
Relaying rails, subject to inspection	23.00 to 24.00
Heavy melting steel	13.00 to 13.50
Mixed country steel	11.50 to 12.00

We quote as follows net tons:

No. 1 R. R. wrought	15.50 to 16.00
No. 2 R. R. wrought	14.50 to 15.00
Shafting	15.50 to 16.00
Dealers' forge, No. 1	12.00 to 12.50
Wrought pipe and flues	11.00 to 11.50
No. 1 cast, 150 lb. and less	13.50 to 14.00
No. 1 mill	9.00 to 9.50
No. 1 Busheling	11.50 to 12.00
No. 2 Busheling	11.00 to 11.50
Country sheet	7.50 to 8.00
No. 1 boilers, cut	10.50 to 11.00
Boiler punchings	13.50 to 14.00
Iron car axles	21.50 to 22.00
Steel car axles	16.50 to 17.00
Iron axle turnings	10.75 to 11.00
Cast borings	8.00 to 8.50
Mixed borings, etc	8.00 to 8.50
Machine shop turnings	10.25 to 10.75
Railroad malleable	13.00 to 13.50
Agricultural malleable	12.50 to 12.75
Stove plate and light cast scrap	11.00 to 11.50
Old iron splice bars	17.00 to 17.50

CINCINNATI.

Demand for Pig Iron Slightly Improved—Prices Fairly Well Maintained.

September 6.

Pig Iron.—In a general way the demand for pig iron has been slightly improved the past week, and correspondence in the offices of sales agencies indicates more interest in the market. The improvement is slight, but in contrast with the previous two weeks, is encouraging. Most of the inquiries are for small tonnage and early shipment. Some of the iron wanted is plainly to take the place of iron which has not come forward on contracts as promptly as expected. No large sales have been reported, but there is a fair run of inquiries. One melter calls for 3,500 tons of foundry iron for delivery in October, November and December; another wants 1,000 tons of malleable iron; a Northern Ohio concern asks for prices on 500 tons of Southern iron for last quarter delivery and 500 tons for the first quarter of next year; another wants 500 tons of No. 2 foundry, either Northern or Southern, for last quarter delivery. The inquiry for 2,000 tons of No. 2 soft, for prompt shipment which was in the market last week, is still pending, as the buyer is not willing to pay current quotations. This same purchaser has been able to get some Southern iron at a shade under $11.50 Birmingham basis, but not in sufficient quantity to cover his wants. An Indiana melter is in the market for 1,000 tons of foundry iron which may be closed up this week. Prices on the whole are fairly well maintained and the going quotations are within the range of $11.50 to $11.75 Birmingham basis for Southern iron and $14 to $14.50 for Northern. Malleable is said to be firming up and some Southern Ohio furnaces are holding for $14.50, although quotations of $14 are still claimed to be obtainable. The lower grades of Southern iron are plentiful and dull with no improvement in the price of gray forge, which is quoted as low as $10 Birmingham. Reports indicate that foundry trade is good and all through the territory there is heavy consumption. The output of Southern furnaces is reported to be slightly increasing. The undertone to the market is firm and there is a feeling of confidence in the outlook. The reports of heavy steel tonnage being sold, the activity in malleable, and the lack of complaint from any quarter in the iron and steel industry, have the effect of sustaining prices in the face of the lack of new business just at this time. There are those who believe, however, that, should there be no pronounced buying within the next 30 or 60 days, the market will feel the effect of augmenting stocks. We quote f. o. b. Cincinnati:

Southern Foundry No. 1	$14.75 to 15.25
Southern Foundry No. 2	14.25 to 14.75
Southern Foundry No. 3	13.75 to 14.25
Southern Foundry No. 4	13.50 to 14.00
Southern Foundry No. 1, soft	14.75 to 15.25
Southern Foundry No. 2, soft	14.25 to 14.75
Gray Forge	13.00 to 13.75
Northern Foundry No. 1	15.65 to 15.90
Northern Foundry No. 2	15.15 to 15.40
Northern Foundry No. 3	14.65 to 14.90
Jackson County Silvery, 8 percent	18.15
Southern Charcoal	18.25 to 18.75

Finished Material.—An advance of $2.00 per ton on structural shapes is reported during the week, but jobbers have not advanced their retail quotations. Bar iron is stronger and the quotation of 1.65c, while still obtainable, is being supplanted by a quotation of 1.70c, and the market shows a strong upward tendency. Jobbers report a good demand, and nearly every item on the list is strong. Bar iron is quoted at 1.65c to 1.70c; steel cars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets, No. 10 and No. 12, in car lots are 2.48c. We quote black sheets, No. 27 at 2.30c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of store at 2c for ¼ in. and 2.10c for 3-16, No. 8 and No. 10. Beams and channels are quoted at 2.25 to 2.50c from stock and angles at 2c to 2.05c for base sizes.

In merchant pipe the feeling is still unsettled, and prices are being shaded by independent mills on desirable business, but the schedule of the leading interest is unchanged. We quote f. o. b. Cincinnati:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black.	Steel Pipe. Galv.	Guaranteed Wrought Iron Pipe. Black.	Guaranteed Wrought Iron Pipe. Galv.
	Percent.	Percent.	Percent.	Percent.
⅛ and ¼ inches	65.35	49.35	63.35	47.35
⅜ and ½ inches	69.35	57.25	67.35	55.35
¾ to 6 inches	73.35	63.35	75.85	61.85
7 to 12 inches	68.35	53.35	66.85	51.35

Old Material.—The market remains strong and quotations are well maintained. Dealers demand strong quotations. There is not much increase in actual consumptive demand. We quote:

Old No. 1 railroad wrought, net tons	$14.00 to 15.00
Cast machine and foundry, net tons	12.00 to 13.00
Old iron rails, gross tons	20.00 to 21.00
Old steel rails, gross tons	15.00 to 16.00
Old short lengths, gross tons	14.00 to 15.00
Old iron axles, net tons	20.00 to 21.00
Stove plate, net tons	9.50 to 10.00
Wrought turnings, net tons	9.00 to 10.00
Cast borings, net tons	7.50 to 8.00
Car wheels, net tons	14.00 to 14.50

Coke.—The market continues active and with quotations showing gradual firmness and some prices are higher again this week. Ovens are showing more strength and are unwilling to accept contracts at figures which they were seeking to obtain only a few weeks ago. Foundry interests are on the other hand showing more interest in the market and some contracts have been placed during the week, for fairly good lots.

†Wise County, Va. Furnace Coke prompt shipment	$2.15 to $2.25 per ton
Wise County, Va. Foundry Coke on contracts	2.40 to 2.50 per ton
Pocahontas Furnace Coke on contracts	2.00 to 2.10 per ton
Pocahontas Foundry Coke on contracts	2.25 to 2.50 per ton
*Connellsville Furnace Coke on contracts	2.00 to 2.10 per ton
*Connellsville Foundry Coke on contracts	2.40 to 2.60 per ton
Kanawha Furnace Coke on contracts	2.00 per ton
Kanawha Foundry Coke on contracts	2.35 to 2.50 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices.

*Connellsville Coke inside prices apply to "main line" ovens and not to strictly Connellsville Coke.

The next convention of the National Association of the Master Sheet Metal Workers is to be held at Indianapolis.

PHILADELPHIA.

Market Continues Quiet With Prices Steady—Rail Mills Busy.

September 6.

Pig Iron.—This market has not as yet experienced the pronounced activity that is reported from Chicago and other Western trade centers. By this it is not meant that there has been any reaction, but rather that matters continue quiet and prices steady. The feeling among producers continues highly optimistic, and though the prospect of a boom fades with each succeeding week, the best belief is that prices will work somewhat higher before the close of the year. There is a lack of inquiries and orders for the first quarter of 1906, consumers generally contenting themeslves with supplies for this and the last quarter. A large order for Bessemer pig for a local mill, said to be 8,000 tons, has excited much interest, but it cannot be learned that it has been placed. There has been a lively demand for coke, at advancing prices, and this is generally taken as indicating an extremely busy fall. Prices remain substantially unchanged as follows:

No. 1X Foundry	$17 00 to 17 25
No. 2X Foundry	16.25 to 16.50
No. 2 Plain	15.75 to 16.00
Standard Gray Forge	14.75 to 15.00
Ordinary Gray Forge	14.25 to 14.50
Basic	15.00 to 15.50
Low Phosphorus	20.50 to 21.00
Southern No. 2X, rail	15.50 to 16.00
Southern No. 2X, dock	15.00 to 15.50

Finished Material.—The rail and structural mills still carry off the honors for activity, but other lines are getting busier, and the outlook was never brighter. For anything like reasonable delivery of structural material, a considerable premium, sometimes as high as $10 is asked, and from present appearances this pressure on the mills will continue, through the first half of 1906. Beams, channels and angles have been marked up from 1.73½ cents, to 1.83½c, but otherwise prices remain unchanged as follows: Beams, channels and angles, according to specifications, 1.83½c to 1.95c; refined iron bars, 1.63½c to 1.80c; steel bars, 1.63½c to 1.70c; plates, 1.73½c to 1.80c.

Old Material.—The advance in the price of scrap during the last few weeks has brought forth supplies into the market with the material result of checking the advance. There has been no drop in prices, but for the first time in a month or two they may be equaled as substantially unchanged, as follows:

Old steel rails	$16.50 to 17.00
No. 1 steel scrap	15.50 to 16.00
Old steel axles	18.50 to 19.50
Old iron axles	24.00 to 25.00
Old iron rails	20.00 to 21.00
Old car wheels	15.50 to 16.50
Choice scrap, R. R. No. 1 wrought	19.00 to 20.00
No. 1 yard scrap	18.00 to 18.50
Machinery scrap	15.00 to 15.50
Low phosphorus scrap	19.00 to 20.00
Wrought iron pipe	15.00 to 15.50
No. 1 forge fire scrap	14 25 to 14.75
No. 2 forge fire scrap, ordinary	11.50 to 12.00
Wrought turnings	13.50 to 14.00
Axle turnings, heavy	14.50 to 15.00
Cast borings	9.50 to 9.75
Stove plates	12.50 to 13.00

NEW YORK.

All Iron and Steel Products Strong—Great Output of Rails is Predicted.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, NO. 150 NASSAU ST., September 6.

Pig Iron.—The local market is beginning to feel the effects of the increased activity experienced in the Middle West. In spite of three days of pouring rain and a holiday, the sales of the week have been very satisfactory, a total of at least 25,000 tons having been placed. Few of the producers are making vigorous efforts to secure new business, and furance owners in other parts of the country are expected to follow the lead of those in Ohio and Pennsylvania in advancing figures 25 and 50 cents per ton. Inquiries are active, contracts for fully 15,000 tons being under consideration. Of the orders booked few were for more than 2,000 tons, the bulk being made up of small lots. Among sales of foundry iron were three lots of Ohio and Pennsylvania iron, respectively 2,000, 1,000 and 800 tons. Inquiries are mainly for the remaining months of the year. The great demand for steel irons in the West has brought some calls to this market. One inquiry received calls for 6,000 tons, mostly to be delivered some hundred miles from the coast. As regards the market in general, buyers are still quite as cautious as sellers, but there is a well-grounded opinion that a veritable boom is on the way and that 1906 will witness the shattering of all records for production. The following are prices at tidewater:

Northern No. 1 Foundry	$16 50 to 16.75
No. 2 Foundry	16.00 to 16.25
No. 2 Plain	15.50 to 15.75
No. 1 Southern Foundry	16.25
No. 2 Southern Foundry	15.50 to 15.75
No. 3 Southern Foundry	15.25
No. 4 Foundry	14.50 to 14.75

Pig Iron Certificates.—The tone of the market has been firm during the week with considerable disposition to trade, but the close was dull. Most of the interest centered in the months not far distant in the future. Foundry iron warrants follow:

	Bid.	Asked.
October	15.00	15.50
November	15.20	15.50
December	15.20	15.60
February	15.50	15.75

Finished Iron and Steel.—The heavy requirements of the railroads continue to support the market for finished steel products. Prospects of large contracts for more steel rails and cars have been a feature of the week. Many tons for delivery in 1906 have already been booked and negotiations for some 200,000 tons more are pending. The Tennessee Coal, Iron & Railroad Co. has in view enough business to keep its rail mills in operation at full capacity during the entire year. Among sales reported during the week were 25,000 tons to the Pennsylvania railroad for delivery in October and November.

The advance of $2 per ton in the price of structural steel had been anticipated. At present its effect upon the business of this vicinity is inconsiderable, for practically all the Eastern producers are receiving bonuses in excess of the advance. As high as 2.90c is reported to have been paid during the week for beams. The American Bridge Co. reports a very quiet month of August, only about 20,000 tons having been booked. In marked contrast to the activity in heavy material has been the slow trade in plates and smaller shapes. Eastern plate makers who are still largely dependent upon boiler and tank work are still in position to take large orders for early shipment. The following are prices at tidewater: Angles, 3 to 6 in. x ¼ in. and heavier, 1.84½c; beams, 3 to 15 in., 1.84½c; tees, 3 x 15 in., 1.94½c; beams, 18, 20 and 24 in., 1.84½c; tees, 3 x ¼ in. and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine and ordinary firebox, 1.94½c; refined iron bars, 1.60c; soft steel bars, 7.64½c to 1.67c; sheets in carload lots, New York, No. 28, black, 2.40c.

Old Material.—Prices continue firm throughout the list. Wrought material has been in best demand and prices seem to be advancing. Steel and cast scrap have been receiving slightly more attention. Holders of all description of scrap iron are in most cases more anxious to buy

than to sell, and consumers apparently bought only for immediate requirements. The available stock is said to be increasing, but there seems to be no fear that the demand will not equal the supply. The following prices are f. o. b. approximately, at tidewater:

Old iron rails	$20.00 to 21.00
Old steel rails, long lengths	14.50 to 15.00
Old steel rails, short pieces	14.00 to 14.50
Relaying rails	22.50 to 23.00
Old car wheels	15.00 to 16.00
Old iron car axles	21.00 to 22.00
Old steel car axles	18.50 to 19.00
Heavy melting steel scrap	13.50 to 14.00
No. 1 railroad wrought scrap	17.00 to 18.00
Iron track scrap	15.00 to 16.00
Wrought pipe	12.00 to 13.00
Cast borings	8.50 to 9.00
Wrought turnings	12.25 to 12.75

BIRMINGHAM.

Demand for Pig Iron Improved—Great Activity at the Steel Plants.

BIRMINGHAM, Ala., Sept. 4.—After a little quiet spell, there is a change in the pig iron market conditions in this district and the demand is a little improved. Quotations have again moved up to $12 per ton, No. 2 foundry, and bid fair to halt for a while at that figure. There were some sales made in the past two weeks as low as $11.50 per ton, though the aggregate was not large, the smaller companies participating in the business. There is a better inquiry in the market, too, the inquiries being more active than for some weeks, indicating Company has nine furnaces in Alabama in operation and one at South Pittsburg, Tenn. The Sloss-Sheffield Steel & Iron Co. is making iron at six furnaces and getting good results. The Republic Iron & Steel Co. has three furnaces in operation, Alabama Consolidated Coal & Iron Co. three, Woodward Iron Co. two, Tutweiler, Central Foundry Co., Lacey-Buek and Alabama Steel & Wire Co. have one each in blast. The production is hardly more than the demand though, right now.

The Tennessee Coal, Iron & Railroad Co. blew in one of its Oxmoor furnaces during the past week and expects to get the last Bessemer furnace in about the 15th or 20th of this month. The Tennessee Company has two of its six furnaces at Ensley out of blast, one to be rebuilt, No. 5, on the most modern plans possible. The old furnace is being dismantled. The new furnace will practically be a duplication of the No. 6 furnace, which is one of the largest iron makers in the district, having a capacity of between 300 and 400 tons a day. The furnace will be up to date in every particular and should be in operation before the expiration of twelve months. The other furnace is to be repaired and put in shape.

The following quotations are given in this district: No. 1, foundry, $12.50; No. 2, foundry, $12; No. 3, foundry, $11.50; No. 4, foundry, $11; gray forge $10.50; No. 1 soft, $12.50; No. 2, soft, $12.

There is quite a lively sale of iron for delivery during the last quarter of the year and the indications are that there will be need for all the iron that can be manufactured.

A visit to some of the furnace yards in this district showed a large amount of iron stacked up. A casual inquiry was answered that the product was not the property of the manufacturing company but had been sold and only awaited instructions as to delivery. The yards of the Sloss-Sheffield Steel & Iron Co.'s furnaces in the city proper are simply filled with sold iron. There is no hesitation in answering questions to the effect that the iron has been sold and is being shipped as rapidly as men can load the product on the cars.

The only material short, that is raw material, in this district, is coke. It is still necessary to bring considerable coke into the district. The statement is made on good authority that one of the coke manufacturing concerns, which has been in steady operation since the strike of the coal miners began, has been making enough to almost pay the dividends on the preferred stock of the company.

There is still much activity in steel circles, the greatest hindrance being with labor. This scarcity is holding down the production right along. There is plenty of business on hand or in sight for the products of the steel plants in this district, rail, rod, wire, nail and other shapes, but the labor is far from being sufficient. The Tennessee Coal, Iron & Railroad Co. has sold steel rails far into next year. There are rumors that the sales for delivery next year will aggregate of 120,000 tons. A high official, when asked concerning the rail business, said: "It is true that the sales have been large for delivery into next year. It is better that no definite statement be made beyond the fact that a large amount has been sold, in fact enough to assure steady operation for some time to come."

The Alabama Steel & Wire Co. continues to ship its products from its warehouse, the demand for road, wire and nails being very active.

The announcement that the American Cast Iron Pipe & Foundry Co. has selected a site for its plant, was premature. No site has been picked out as yet, though several are under consideration.

CLEVELAND.

Ore Shipments for August—Demand for Pig Iron Fair And Prices Advancing.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, September 6.

Iron Ore.—Although the shipments of ore for August were somewhat less than 5,000,000 tons, being 227,690 tons less than those for July, the showing is a very creditable one, as the heavy rains which prevailed during the month caused much delay at upper lake ports. The shipments for August and for the season to Sept. 1 were as follows:

	August.		To September.	
	1904.	1905.	1904.	1905.
Escanaba	711,756	706,252	1,698,308	3,227,865
Gladstone	.....	.....	480	.....
Marquette	366,172	521,685	818,010	1,882,211
Ashland	134,111	87,651	330,351	512,129
Ashland	254,932	413,533	637,618	1,636,222
Superior	807,278	700,977	1,916,477	3,168,026
Duluth	865,090	1,433,556	2,148,919	5,589,491
Two Harbors	872,245	1,233,256	2,065,833	5,019,660
	4,011,584	4,996,930	9,615,996	21,035,604
1905 increase		985,346		11,419,608

Pig Iron.—Although the failure of the United States Steel Corporation to purchase as large a tonnage as was expected was somewhat disappointing, it is known that the corporation will be compelled to come into the market soon again, and it seems certain that a price not less than $15 will be paid. Basic and Bessemer are now held firmly at $15, Valley furnace, and furnace interests are not anxious to sell even at that advanced price. Considerable foundry iron has been sold within a few days in the Cleveland district and several interests are asking $14.75 Valley for No. 2. There is a stronger demand for coke, and a scarcity of cars is already being complained about. We quote as follows, Cleveland delivery:

Bessemer	$15.00 to 15.85
No. 1 Foundry	15.50 to 15.75
No. 2 Foundry	14.50 to 15.00
No. 3 Foundry	14.25 to 14.50
No. 2 Southern	15.25 to 15.85
Gray Forge	14.25 to 14.50
Gray Forge, Southern	14.00 to 14.25
Lake Superior charcoal	16.25 to 16.50

Finished Material.—Vessel interests have placed orders for plates for five large freighters for next season's delivery. The demand for plates is very strong and it is probable that an advance in price will soon be announced. During the past week orders footing up about 12,000 tons of steel bars have been entered, and it will not be surprising if the price is advanced. The advance in the price of structural material of $2 per ton, although not expected, was generally regarded as justified by present conditions. As the mills have taken orders for all the shapes they can roll for this year, the new price is not expected to have important bearing on the market. The demand for bar iron continues strong, and one local mill now has orders for more than its capacity for this year. Pipe continues dull and weak, and the cutting of the price on sheets, on which there is apparently an over production, is still in evidence.

Old Material.—The demand for old material is still strong, especially on old iron rails, short steel rails, machine cast, iron axles, pipes and flues and tank iron, on all of which prices have advanced from fifty cents to one dollar. We quote as follows, Cleveland deliveries:

Old iron rails	$22.50 to 23.50
Old steel rails (over 6 feet)	15.50 to 16.50
Old steel rails (under 6 feet)	16.50 to 17.50
Old car wheels	15.00 to 15.50
Steel boiler plate	12.00 to 13.00
Steel axles	18.00 to 19.00
Malleable iron (railroad)	15.00 to 16.00
Malleable iron (agricultural)	14.00 to 15.00
Heavy steel	15.50 to 16.00

We quote as follows, net tons:

No. 1 R. R. wrought	15.00 to 16.00
No. 1 busheling	13.50 to 14.50
No. 1 machine cast	13.25 to 13.75
Iron axles	21.00 to 22.00
Axle turnings	11.50 to 12.50
Wrought turnings (free from cast)	10.50 to 11.50
Grate bars	8.50 to 9.50
Pipes and flues	12.50 to 13.50
Tank iron	10.00 to 10.50
Hoop and band iron	8.00 to 9.00
Sheet iron	7.00 to 8.00
Wrought drillings	10.50 to 11.50
Stove plate	10.00 to 10.50
Cast borings	8.50 to 9.50

INTERESTING FACTS

Developed at the Hearing of a Case Against Lease Holders.

DULUTH, Sept. 4.—In the trial of the case of the State of Minnesota against the holders of a lease north of Virginia, on the Mesabi range, the following facts came out as to State leases and mineral contracts: The State has issued 4,313 leases, most of which have been made into contracts; 148 of these are still alive. A few of the latter have developed into paying mines. More than $500,000 has been spent in exploring these State lands and about $900,000 more in developing the ore bodies found. An additional million dollars has been paid in bonuses for State tracts. For the 4,000 original leases the State received the sum of $110,000. Of the going contracts 26 are in operation and these have paid the State $542,000 in royalties. In all the State has received $830,000 for its iron lands and ore mined.

August ore shipments via the Duluth, Misabi & Northern road were the largest known and footed up a total of 1,433,555 tons gross. These docks have shipped to date this year 940,000 tons more than during the entire season of 1904.

The molders at the Blacklock Foundry, South Pittsburg, Tenn., who went back after being on a strike for two weeks, are out again. No settlement has been effected as yet through the president of the Iron Molders' Union, and the men are on the payroll of the international treasury.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., September 6.

Pig Tin.—The market has declined sharply since last Friday, owing to the report of larger available supplies and unfavorable statistics. According to figures collected by Secretary Mayer, of the New York Metal Exchange, the total vizible supply on Aug. 31, 1905, was 92 tons above that of the same date, 1904. The deliveries for August were 2,900 tons. Today's closings follow: Spot, 32.40c to 32.50c; September, 32.25c to 32.50c; October, 32c to 32.50c; London, £147 10s and £146 15s. Arrivals 25 tons to date, with 3,445 tons afloat.

Copper.—Dull and nominal characterizes the market of the past week. Today's closings: Lake and electrolytic, 16¼c to 16¾c; casting, 15⅞c to 16⅛c. London's closings today: £70 5s and £70 26s. Exports for August, 21,420 tons.

Lead.—Only a moderate amount of business was transacted and the close today was steady at: 4:85c to 4.90c. St. Louis, 4.77½c; London, £14 7s 6d.

Spelter.—The market has been firmer with a larger demand. Closing quotations today were: Spot, 5.75c to 5.85c; St. Louis, 5.65c; London, £26 5s.

Antimony.—The market is dull and difficult to quote. Cookson's and Hallet's 14c, and other grades 12c to 13c.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, September 6.

Metal prices fell off slightly last week as a result of the peace compact. The weakness is considered only temporary by local jobbers who believe that under the improved demand following the cessation of hostilities created by the exportation of all kinds of machinery to both countries the market will quickly re-establish itself on the old basis. Lake copper is now quoted 17c for carload lots, Chicago, and 17¼c for less than carload lots. Casting sopper, 16⅞c for carload lots, and 17¼c for less than carload lots. Spelter is lower, selling at 5.85c for carload lots and 6⅛c for lesser quantities. Sheet zinc is without change, and is strong at 7¼c for carload lots of 600-lb. casks, and 7½c for less than carload lots. Pig lead, 4.85c for 50-ton lots, 4.90c for carload lots, and 5c to 5⅛c for less than carload lots. Antimony is without change, though Hallett's is practically unobtainable. We quote the former at 17c, and Cookson's at 18c.

Dealers in old metals are very sanguine over the future. Trading of fair proportions and prices very firm. We quote copper wire, 13¾c, heavy copper, 13¼c; copper bottoms, 12c; copper clips, 13c; red brass, 12¼c; red brass borings, 10c; yellow brass, 8¼c; yellow brass borings 8¼c. Pipe lead ,4c; tea lead, 3.75c; zinc, 4.

Dravo, Doyle & Co., merchant engineers, Pittsburg, Pa., have been awarded the contract for air compressors and all appurtenances for operating the locks at new lock No. 2, Monongahela river, and for the entire electric light plant to be installed in the Western Pennsylvania Hospital at Dixmont, Pa., consisting of two 75 K. W. and one 25 K. W. direct connected engine-generator sets.

The Chapin-Stephens Co., Pine Meadow, Conn., is distributing catalogues illustrating its various tools, such as rules, plumbs and levels, planes, scrapers, saw frames, etc. The book is well gotten up and contains nearly 100 pages. It is well illustrated and gives information concerning a great variety of tools.

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SEPTEMBER 7, 1905

Americans interested in the iron and steel business, visiting in Europe, will find The Iron Trade Review on sale at the office of the International News Co., Breams Buildings, Chancery Lane, London, E. C., England. Copies will be forwarded on request, from London to any address in the world.

STEEL TIES A TONNAGE PROPOSITION.

Daily press comments, based upon the original statement in these columns that should the present form of steel tie become a tonnage proposition the price would probably be about $2.00 apiece, carry the comment attributed, of course wrongfully, to "manufacturers" that the cost would then be lowered to a par with structural material. The real point is entirely lost. If steel ties are ever adopted on a commercial basis, the price will be much less than that of structural material. At the time these comments were made, the regular price of beams and channels, 15-in. and under, was 1.6c per pound, which would make a 167-lb. tie cost, exclusive of fastenings and the punching, etc., which would be an extra in structural material, $2.67, so that the total cost would be in the neighborhood of $3.00 instead of $2.00, while at the latter price the shape which contributed to the tie would not be raised at much over a cent a pound.

The fact of the steel tie promising to be, if anything at all, the greatest tonnage producer the steel trade has ever seen, is lost sight of. There is no reason to suppose that there would be any great range in the size or shape of the structural section. The present tie runs 215 tons to the mile, and there are more than 275,000 miles of track in the United States operated by the standard steam roads. To lay each year but 5 percent of the existing track with steel ties would means 3,000,000 ties annually. Never yet has rail production in the United States reached this figure, but there are many weights of rail per yard, and many sections, favorites with different roads, for each weight. In structural shapes, with which the daily press compares the steel tie, the maximum production thus far has been 1,300,326 tons, in 1902, and this tonnage not only covers the entirely different sections of beams, channels, angles, zees, tees, etc., but numerous sizes in each shape and several weights in each size. While the changes in weight are made by simply setting and not changing or turning the rolls, they are to an extent made at the expense of time and tonnage. There is really no comparison between structural shapes as we know them, and the steel tie of the future, if it becomes a commercial proposition.

LATENT STRENGTH OF THE STEEL MARKET.

Not in years has there been an advance in any of the heavy steel products which has approached in suddenness that in structural shapes made last Thursday afternoon. With practically no note of warning the different mills compared notes and decided that all conditions warranted, if not actually demanded, an advance in this product, which was accordingly made to take effect immediately.

The conditions were that since the beginning of the year the structural mills had been forced to run to their full capacity, that specifications were in hand with most of the mills to run them through the entire year, and that specifications were in prospect on definite obligations of the manufacturers for an additional tonnage which would mean the carrying of a large tonnage over into 1906. At the same time projects were in discussion promising an unprecedented tonnage for next year, and buyers desired to place their contracts early. Although actual plant had been considerably increased and operation been made more efficient, a tonnage was in prospect beyond the capacity. There is always the danger in such cases that demands for prompt delivery may force exhorbitant premiums, distress consumers and lay the foundation for a collapse. No structural tonnage has yet been booked for next year, and ample time is allowed for those who contemplate large projects to let the advanced price enter into their calculations.

As an exhibition of latent strength in the steel market the advance of $2.00 a ton in structural shapes is remarkable. Previous advances have generally been heralded for weeks in advance, and made when there were large tonnages booked for deliveries more or less concurrent with those which would be called for on contracts to be booked at the new price. In this case the new price will become effective, as to actual shipments, at substantially the same time in all cases.

The new price, based on 1.70c for beams and channels, 15-in. and under, is the highest official price which has ruled since 1900. An advance to 1.60c was

made in the spring of 1901, and this remained the official price through the famine of 1902, when premiums on a relatively small tonnage were freely paid. The low price of 1.40c was officially in force only from September 6 to December 20 of last year, the price being 1.50c until the advance of February 16 to the recent basis of 1.60c.

Production of structural shapes in the current year will undoubtedly break the record of 1902, when the production, according to official returns, was 1,300,326 gross tons, this quantity covering only regular structural mill products, and neither merchant mill products nor plates used for structural purposes. The production in 1904, 949,146 tons, was the smallest since 1900. In 1895 and 1896 the production averaged about half a million tons.

A GREAT RECORD OF ORE SHIPMENTS.

When the unusual weather conditions which prevailed during July and August in the Mesabi district are considered, the record of ore shipments is astonishing. The total for August is only about 200,000 tons less than for July. The detailed statement is published elsewhere in this issue.

Again severe rains through the Northwest have stopped steam shovel mining on the Mesabi range, and for a few days late last week and probably early this one, mines have been going under check, but it is surprising that, in spite of these rains, which this year have been unusually frequent and severe, and the effect of which has been remarked by all mining men and correspondents as very bad, the mines are able to maintain their pace and even to increase it with remarkable regularity. The reserve power of Mesabi range mines is tremendous. Advices from the various upper lake iron ranges are that stock piles will be about cleaned out the last of September, and that thereafter shipments will be considerably diminished. Many of the biggest mines will have their stocks all shipped, if no difficulty arises, in two weeks.

Mr. Fritz on the Iron and Steel Trade.

John Fritz, for more than half a century identified with the iron and steel industries of this country, in an interview in the current issue of the *Manufacturers' Record* said:

"The great problem with our iron and steel makers will be to find the ore and build the works to produce sufficient for the world's need." Referring to the question of ore, Mr. Fritz stated that some time ago, that when he was dining with Mr. and Mrs. Carnegie, this subject was under discussion, and Mr. Carnegie said, 'iron ore is king,' to which Mrs. Carnegie added, 'and coal is queen.'

"I am inclined to think," continued Mr. Fritz, "that the iron and steel people can scarcely build ahead of the consumptive requirements which will be developed by the world's needs, and the very ability to provide will create increased needs. There is room enough for expansion, not only on the part of the great corporations now in existence, but room for new iron and steel works wherever an ample supply of ore and coke can be bought together at a fiugre to make cheap production possible, and in the future I think the tendency will be more and more towards a higher grade of metal. There is vast room for improvement in the quality of steel. The time has come when we should seek for quality as well as quantity. There is a great future before the South."

IMPORTS AND EXPORTS FOR JULY.

A large decrease in the month's exports for July, 1905, is shown in comparison with the same period in 1904, the figures being 69,842 tons in 1905, against 108,992 in 1904. The same tendency prevailed throughout the seven months ending July, 1905, though not so markedly in the aggregate as in this one month. For seven months ending July, 1904, the export tonnage was 607,334, as compared with 534,849 this year. A falling off in every product except structural material and wire, accounts for the decrease, which in some instances as scrap and billets, was very large, scrap diminishing from 3,135 to 242 tons and billets, ingots and blooms from 35,904 to 12,664 tons.

EXPORTS OF IRON AND STEEL FROM THE UNITED STATES—GROSS TONS.

	July		7 mos. ending July	
	1904	1905	1904	1905
Pig iron	4,011	1,882	26,324	31,541
Scrap	3,135	242	14,282	4,284
Bar iron	2,020	1,855	17,413	19,989
Wire rods	770	125	5,444	3,464
Steel bars	1,759	1,070	14,087	12,558
Billets, ingots and blooms	35,904	12,664	208,072	100,563
Hoop, band or scroll iron	84	174	1,918	1,602
Iron rails	4		1,382	
Steel rails	40,348	26,208	174,642	155,194
Iron sheets and plates	208	206	2,664	3,492
Steel sheets and plates	3,608	2,770	16,717	36,304
Tin plates, terne plates and taggers' tin	232	120	3,748	5,982
Structural material	4,021	6,364	28,124	45,540
Wire	7,520	11,920	66,902	76,970
Cut nails	1,071	501	6,069	5,021
Wire nails	2,026	3,006	16,843	21,894
Other nails, including tacks	282	357	1,654	2,451
Total	108,993	69,842	607,334	534,849

In contrast to the exports, the import tonnage showed a sharp increase in both totals. For the corresponding months in 1904 and 1905 the tons imported were 21,857 and 36,432, an increase for July, 1905, of 14,575 tons. For the seven months' period the comparison of 176,121 tons in 1904 with 212,547 tons in 1905, shows an increase of 36,426 tons. The most marked increase was in the movement of pig iron from foreign producers, a movement which has been noted elsewhere, the imports for July, 1904, being 4,090 tons, as compared with 21,927 tons during the same month this year. This importation has been in progress all year, as indicated by the fact that 109,816 tons of pig iron have been imported since Jan. 1, 1905, as against 48,102 for the same length of time last year.

IMPORTS OF IRON AND STEEL TO THE UNITED STATES—GROSS TONS.

	July		7 mos. ending July	
	1904	1905	1904	1905
Pig iron	4,090	21,927	48,102	109,816
Scrap	314	147	8,894	7,916
Bar iron	3,114	3,358	13,110	19,143
Iron and steel rails	3,581	202	34,028	9,898
Hoop, band or scroll	265	522	1,233	1,273
Steel ingots, slabs, billets or bars	879	2,364	7,492	7,970
Sheets and plates	156	168	3,281	1,235
Tin and terne plates	7,341	4,725	42,114	40,732
Wire rods	1,428	1,095	9,515	9,152
Wire and wire articles	334	235	2,552	2,348
Structural shapes	235	1,664	5,800	3,064
Total	21,857	36,432	176,121	212,547

Will Keep the Door Open.

It certainly does not lie with Russia, whose cynical disregard of her promises brought about the war, to call in question the sincerity of the Japanese devotion to the principal of the open door. Nobody entitled to speak with any degree of authority about that policy entertains any doubt that Asia and the world at large will profit from the newfound ascendency of Japan. It has been declared that, without formal proclamation, this ascendency involves the recognition of a new Monroe Doctrine for Eastern Asia.—[New York Journal of Commerce.

NEW PRESIDENT OF ALLIS-CHALMERS CO.

Walter H. Whiteside Will be Elected as Unanimous Choice of Directors.

At the meeting of the directors of the Allis-Chalmers Co. to-day, Thursday, Walter H. Whiteside will be chosen president of that concern to succeed President Warren, who has for some time contemplated resigning. Since Mr. Warren left for Europe last April, Mr. Whiteside, as vice president and general manager, has been the active head of the organization. The improved report of the company which has just been issued is one of many proofs of the ability with which he has conducted the company's affairs. The unanimity with which the directors have looked to Mr. Whiteside as the logical successor to the presidency is a well earned tribute to his energy, wisdom and integrity.

Walter H. Whiteside began his business career in 1881 with the Dupont Powder Works, and during the three years

WALTER H. WHITESIDE.

of service with that concern was instrumental in introducing its high explosives throughout the Michigan copper countries as well as other copper mining districts. In 1885 he accepted a position with the Cleveland Electrical Co., Cleveland, remaining with that company nearly twelve years, and for the greater part of the time occupying a position of manager of its Chicago office. In 1896 he was appointed manager of engine sales for the Gates Iron Works, of Chicago, which position he resigned in 1898 to accept employment with the Westinghouse Electric & Mfg. Co., being appointed to the position of district manager in Washington, D. C. In this position Mr. Whiteside became associated with the largest electrical projects undertaken in the territory assigned to that office and also in other places farther removed. His engineering work in connection with the installation of electrical power in the dry docks of the navy department, especially at Kittery, League Island and Charleston, have been widely recognized. From district manager of the Westinghouse Company's office in Washington, he was promoted to the management of a department created upon his recommendation, that of details and supplies, which in a short time became one of the largest and most profitable departments in the Westinghouse organization. Two years later, in addition to those duties, he was appointed to the position of general manager of the Sawyer-Man Electric Co., of New York, a subsidiary organization, whose operations are confined entirely to the manufacture of incandescent lamps. Into these departments he injected life and vigor, giving an administration that won recognition for his high executive ability. He built up the detail, supply and incandescent lamp organization practically as it exists today, and established a large and successful business in those lines. His work there was given particular prominence by the success attained in devising methods to promote and secure sales in those products throughout all parts of the country, and in securing the co-operation of that company's salesmen, whose energies previously were devoted almost exclusively to the sale of machinery, and in addition developing close trade relations with supply dealers. After nearly seven years of service with the Westinghouse Company, Mr. Whiteside was appointed general manager of sales of the Allis-Chalmers Co. and given entire charge of the commercial organization of that company, including the electrical department of The Bullock Electric Mfg. Co., of Cincinnati. After a few months' service as general manager of sales of the Allis-Chalmers Co., he was appointed vice president and general manager of that company. Mr. Whiteside is a man of strong character, possessing keen intellect and shrewd business judgment. His high sense of justice and manner of fair dealing, together with his well-known policy of indicating substantial recognition for merit and ability, have created in the organization of which he is general manager a spirit of loyalty and faithfulness which is worthy of special comment.

RAPID PROGRESS

Of the Atikokan Iron Co. in Putting in Foundations For Its Plant.

Port Arthur, Ont., Sept. 5.—The Atikokan Iron Co. is rapidly putting in the foundations for its coal docks, blast furnace and other works on the harbor front here. The location of the works is about half way between this town and Fort William, on the shore of Thunder bay, and pile driving has been carried out in the harbor for a distance of half a mile. It is at the outer end of this work that the company will erect its plants. It is still hoped that the coal docks will be ready to receive some coal this fall, but it will be very late before they can be far enough along for that. The furnace can scarcely be ready before late next year. Coke ovens of the beehive type will be built, but no steps have yet been taken toward construction. To facilitate the smelting of the magnetic sulphuric ores of the Atikokan a large crushing plant and roasting beds will be established at the furnace, waste gases of the stack being expected to do what roasting is needed. At the mine, 130 miles west of this city, the Canadian Northern has built a spur to the property now under development, and tunnels are being driven into the ore formation, exposing a large quantity of high grade ores. Diamond drilling at depth will determine the extent of the ore bodies, which are now known to be important. It was expected that John Pengilly, formerly manager of the Chandler mine in Minnesota, would become manager of this property, but he has decided that his health will not permit. While nothing more than a blast furnace and fuel plants are now planned, the company contemplates increasing the extent of its works as soon as it is assured of success, and intends in time to become a large factor in the iron and steel development of Western Canada.

SHARP DECLINES THE RULE.

Bear Interests in Control—Speculation on Commercial Effect of Peace.

Perceiving an opportunity, when various interests were taking advantage of the peace announcement to sell and the monetary situation which was rather discouraging, the bear side hit the market hard at the opening Wednesday a week ago and continued to drive it down all week. Sharp losses were experienced in almost all the stocks and on Thursday affairs look very bad. The prosperous condition of industrials and the well known basis of prosperity lent a firm support, however. In contrast to the activity of Lawson interests on the bear side of the market the Morgan issues were the only ones to show a uniform air of firmness throughout the week. Amalgamated copper declined sharply under the bear movement.

Money was tight throughout the week, call loans reaching 3 percent at one time. Bank reports showing low reserves and a loss to the subtreasury of over $7,000,000, induced fears of a financial stringency. On Tuesday, Sept. 5, the market recovered abruptly and many recoveries of two points were made, the week closing with the prospect of a further bear attack being successfully resisted. Ever since the ratification of peace terms, interest has been directed toward the extent to which Japan and Russia will be in our market in their period of recuperation and the feeling is broadcast that the United States will benefit largely.

	Aug. 28	Sept. 4	Changes
Allis Chalmers Co	16¼	15½	— ¾
Allis Chalmers preferred	56	53⅞	—2⅛
American Can	11½	11⅛	— ⅜
American Can preferred	71½	70½	—1
American Car and Foundry	37¼	35¾	—1½
American Car and Foundry preferred	....	100⅝	....
American Locomotive	52½	50	—2½
American Locomotive preferred	113¾	112¾	—1
American Shipbuilding	52	52½	+ ½
American Shipbuilding preferred	105	105	....
American Steel Foundries	9½	9	— ½
American Steel Foundries preferred	39⅞	39⅜	— ½
Barney & Smith	....	20	....
Barney & Smith preferred	....	128½	....
Bethlehem Steel	33	31¾	—1¼
Bethlehem Steel preferred	89	88	—1
Bullock preferred	....	113	....
Cambria Steel	27¼	26⅞	— ⅜
Colorado Fuel & Iron	46	43	—3
Colorado Fuel & Iron preferred	....	....	....
Crucible Steel	12½	12½	....
Crucible Steel preferred	64	64	....
Empire Steel	....	6	....
Empire Steel preferred	....	35	....
Fay & Egan	....	60	....
Fay & Egan preferred	....	120	....
General Electric	182½	180	—2½
International Pump	27½	27⅛	....
International Pump preferred	83	82	—1
Lake Superior Corporation	....	17	....
Niles-Bement-Pond	115	126½	+10½
Niles Tool Works preferred	....	130	....
Otis Elevator Co	....	60	....
Otis Elevator Co. preferred	....	107	....
Pittsburg Coal Co	14	13⅝	— ⅜
Pittsburg Coal preferred	52	53	+1
Pressed Steel Car	45¼	43¼	....
Pressed Steel Car preferred	96½	95½	—1
Pullman Palace Car	246	247	+1
Railway Steel Spring	37¼	36¼	—1
Railway Steel Spring preferred	100⅝	99	—1½
Republic Iron & Steel	21¾	20½	—1¼
Republican Iron & Steel preferred	....	88⅞	....
Sloss-Sheffield	91	89	—2
Tennessee Coal & Iron	90½	86	—4½
U. S. Cast Iron Pipe & Foundry Co	30⅜	30¼	— ⅛
U. S. Cast Iron Pipe & Foundry Co. preferred	....	91⅝	....
U. S. Steel	36⅞	36¼	— ⅝
U. S. Steel preferred	104⅝	103⅝	—1
U. S. Steel 5's	97½	97½	....
Virginia I. C. & C. Co	40½	40½	....
Westinghouse Electric	170	166	—4
Westinghouse Air Brake	....	148¼	....

The following is a daily review showing the features of the week in the market:

Wednesday, Aug. 30: The market was a disappointment to those who awaited a continued bullish movement. The opening was weak and irregular and large selling orders developed. Heavy bear interests exerted a pressure on stocks and many issues suffered declines up to two points during the day. Slight tendencies to recover during the day made little headway. Interests endeavoring to realize on the peace announcement added to the downward trend. Favorable reports on industrials in iron, steel, copper and coal were somewhat offset by unfavorable railroad reports and low bank reserves.

Thursday, Aug. 31: The bear interests controlled the market at the opening. Reports of a $10,000,000 bear pool operated by Lawson accompanied by the activity of the Gates interest carried prices to a sharp break and caused considerable uneasiness. Orders to sell "at the market" flooded the brokers. At the low figures however most of the issues received some support. Great stress is laid upon the anticipated lightness of money by speculators. Trading was somewhat dull.

Friday, Sept. 1: Bear pressure continues to drive the market to declines, Amalgamated copper especially receiving attention. Morgan interests and United States Steel remain firm. Call money was reported up to 3 percent though it could be obtained later at 2½. Later in the day the market assumed a firmer tone only to suffer a further decline at closing. There seems to be no legitimate prospect of an immediate rise and public interest has been materially dulled. One short sale of 10,000 shares was recorded late in the day.

Saturday, Sept. 2: The usual ante-holiday quietness prevailed. In the earlier part of the day speculators were awaiting the issuance of the bank report and their fears were confirmed on its appearance disclosing a diminution of reserves and a loan decrease of $7,700,000. London and Paris markets were more cheerful and a considerable evidence of strength prevailed at the lower levels.

Monday, Sept. 4: Holiday.

Tuesday, Sept. 5: A marked rise in stocks, featured by the covering of "shorts" was the rather unexpected development today. The market opening under the influence of extensive London purchases assumed a stronger tone at once. Reading especially recovered rapidly, rising 4⅞ points. Traffic reports from railroads aided in upsetting the bear contingent. The money situation is considered quite serious.

The Allis-Chalmers Co. Report.

Although the report of the Allis-Chalmers Co., advance sheets of which have just been approved, does not present a favorable contrast in the comparisons of 1904 and 1905, a much brighter aspect has existed in the last few months and continues into the future. The comparison shows:

	1905 14 Mos.	1904 12 Mos.	Decrease
Net profits	$68,982	$952,624	$883,642
Divs. pf. stk. (5¼%)	.....	856,125	853,125
Surplus	$68,082	$99,499	$30,517

In his report President B. H. Warren says: "The contraction in general business referred to in the last annual report, as then justifying the postponement of dividends, continued during the first half of the last fiscal period, with particular manifestation in the steam engine department of this company. This was due largely to the introduction of steam turbines, especially those of large capacity, for which certain manufacturers had been preparing for several years. The present manufacturing space and facilities being inadequate for the manufacture of the new lines of machinery referred to, and in order to provide for the economical manufacture of electrical apparatus in the same works where the prime movers, namely, steam turbines, reciprocating engines, gas engines and hydraulic turbines, are constructed, it was decided to make important additions to the West Allis Works, and new buildings are now in process of erection pursuant to the original plans therefor. The capacity of this plant will be nearly doubled by these enlargements.

"Soon after the commencement of this calendar year an improvement was manifested in the general business of the company, the orders increasing in April to the normal volume and since then exceeding in extent the previous record of

the organization; but the results of these orders will be realized only upon their execution and the delivery of the work. This increase pertained more particularly to the older branches of the business of the company. The steam turbine rights heretofore acquired by this company have been supplemented in an important manner by further patent acquisitions and alliances, so that it is confidently asserted that this company is now prepared to place upon the market steam turbine and turbo-generating units that will enable it to retain its position as a leading manufacturer of steam engines of the most successful types. The works are now engaged in filling one of the largest single orders for steam turbines that have ever been placed in this country, the installation of which will be completed by the end of the present calendar year. A number of important contracts for hydraulic turbines have also been secured."

Financial Notes.

The fiscal year of the Crucible Steel Co. of America closed on Aug. 31, and the annual report will be made public in October on a date not yet fixed. It is stated that the earnings of the year just closed are greater than those of the preceding year but the amount will not be given out in advance.

A meeting of the directors of the Sloss-Sheffield Steel & Iron Co. will be held on Sept. 12 to consider the matter of dividends and also an increase of the common stock from $7,500,000 to $10,000,000. It is reported that the company has spent about $3,500,000 in extensions and improvements out of the earnings and that an adjustment with the holders of common stock is contemplated.

Stock of the American Rolling Mill Co., of Zanesville, O., which recently absorbed the Muskingum Valley Sheet Steel Co., has been placed on the market at a premium of $5. Twenty-five hundred shares of par value $100, are to be disposed of. The officers of the newly consolidated company are: President, George M. Verity, Middletown; secretary, R. C. Phillips, Middletown, and directors, William Christie Herron, Cincinnati; J. M. Iseminger, Middletown, and W. S. Horner, Pittsburg.

The O. L. Packard Machinery Co., Milwaukee, has increased its capital stock from $65,000 to $100,000. James Morrison is the president and Frederick H. Kappen, secretary.

The Haven Malleable Castings Co., Cincinnati, has increased its capital stock from $75,000 to $100,000.

The report of the American Locomotive Co. will be forthcoming early in September. It will show that heavy appropriations have been made out of the profits for the fiscal year ended June 30, for extraordinary improvements reducing the surplus applicable to common dividends to something like 2 percent for the year. The actual earnings on the stock, including the amount appropriated for special improvements, will probably be between 7 percent and 8 percent. This would compare with about 14¾ percent in the preceding year. The question of dividend payments on the common stock is a matter for consideration in the future. But it is known that the management will not begin dividend payments until it is morally certain that they can be continued through years of large and small earnings alike. The outlook for the coming fiscal year is declared to be very bright. The company is now receiving large orders for new buisness and from all indications the present fiscal year will show heavy gains in the company's returns.

The Wakefield Iron & Coal Land Improvement Co., of Milwaukee, Wis., filed an amendement to its charter decreasing its stock from $2,500,000 to $250,000.

A dividend of two percent has been declared on Cambria Iron stock, payable Oct. 2.

WILD STORIES

Concerning the "Cuyuna Range"—Ores High in Phosphorus and Manganese.

In view of the boom articles now emanating from Duluth, and signed by one John L. Morrison, regarding the new so-called "Cuyuna range" west of there, this statement from the Virginian, a paper published at the Mesabi range town of Virginia, is interesting:

"A local exploration company which owns a 40-acre tract on the new Cuyuna range and has drilled four holes thereon, one in ore, recently offered the forty to a prominent mining concern for the cost of the exploration, about $6,000. But the offer was refused. The ore so far found on the range is of low grade, running from 45 to 55 percent iron, and at the present day the district does not offer very rich returns to explorers. Of course in time ore of higher grade may be discovered."

It is very doubtful if the Virginia paper has not put the average of iron found on the new range—45 to 55 percent—much too high. The correct figure would doubtless be many points under that. The ore, too, is high phosphorus, which hurts it for Bessemer steel, and high manganese, which hurts it for foundry purposes.

At the Florence iron mine, located at the village of the same name, in northern Wisconsin, systematic diamond drilling over a long period has resulted in the discovery of an extension of the well known Florence vein in a portion of the mine that has been worked out and abandoned for many years. This is near old Nos. 1, 2 and 3 shafts, which have been idle a long time. Work is now going on to further determine the size and character of the ore found and a new shaft will be sunk this winter. The mine is shipping about 1,500 tons a day, 1,000 tons from underground and the rest from stock, and will make a record of about 200,000 tons for the year, which is a very large output for this old mine. The property is in better shape than for a long time.

The case of the state of Minnesota vs. Mabel Evans, for the cancellation of her lease on a tract of state land in the Mesabi region has been finished, and a decision is expected soon. The main contention was that all state leases were unconstitutional, and though this was a side issue, it formed the main subject of argument, not only by the attorneys in the case but to those representing interests holding other state lands.

The Meadow mine, belonging in fee to D. T. Adams and others, of Duluth, is under option to Pickands, Mather & Co., and is being drilled by G. A. St. Clair. It contains about 500,000 tons of ore, so far as the present exploration goes, and there may be more with continued development. This mine will probably have to be developed by shaft.

Sheet Metal Workers' Strike.

The Amalgamated Sheet Metal Workers in New York city went on strike Sept. 1 for an advance in wages to $4.50 per day and against an increase in the number of helpers and apprentices. The strike is directed mainly against the Employers' Association of Roofers and Sheet Metal Workers and affects 2,700 men in 47 shops. The following contracts are involved: Hudson River pier at West Twenty-second street, New York Grand Central station, New Tiffany Studios building, Hall of Records, Knickerbocker Hotel, Columbia University and more than a hundred smaller buildings.

The strike is in violation of the arbitration agreement of the Buildings Trades Employers' Association. The executive committee of the association, which consists of six employers and an equal number of employees, held a meeting and an order was issued directing the strikers to return to work pending arbitration of their demands. The employers are said to have offered concessions before the strike was called, but the offer was rejected. If the order to resume work is not obeyed within a reasonable time the union will cease to have representation on the general arbitration board.

PERSONAL.

James Savage has taken charge of the brass foundry of the Penberthy Injector Co., of Detroit, Mich.

D. B. Meacham, of Rogers, Brown & Co., Cincinnati, has returned to his desk after an absence of several weeks' summer vacation.

W. H. Speller has become engaged with the Weber Gas & Gasoline Engine Co., Kansas City, Mo., leaving the Wilcox Mfg. Co., of Aurora, Ill.

President J. W. Duntley, of the Chicago Pneumatic Tool Co., is due to arrive in New York this week, returning from an extended tour in Europe.

R. W. Haseltine, mining engineer, Columbus, O., started Aug. 31 on a tour through the West to be gone for about two months. He will visit Yellowstone National Park, Seattle and Portland.

James Duane has been appointed superintendent of the Standish furnace, of the Northern Iron Co., at Standish, N. Y., and will undertake his duties as soon as the repairs are made.

J. A. Sherwood has accepted a position as sales manager for the Firth-Sterling Steel Co., in Chicago Mr. Sherwood formerly traveled for the Ewald Iron Co., of St. Louis.

Robert L. Livingston, formerly connected with the Allis-Chalmers Co., will hereafter make his headquarters at 74 Broadway, New York city, in the interests of the Engineering Co. of America.

Frank M. Eaton, Cincinnati manager of Hickman, Williams & Co., has returned from an extended trip throughout the West. Mr. Eaton is fully restored to health and will resume his duties at once.

The New Castle Forge & Bolt Co., New Castle, Pa., announces the acceptance of the position as general superintendent of its plant by Joseph A. Thompson, formerly manager of the Standard Engineering Works at Ellwood city.

Herman Henrichs, mentioned in the issue of Aug. 31 as leaving the Morley Murphy Hardware Co., of Green Bay, Wis., will still retain his interest in that concern as a stockholder.

Dr. Herbert F. Sill, research assistant at the Carnegie institute, in Washington, has been appointed an instructor in chemistry in the School of Applied Sciences in the Carnegie Technical Schools, Pittsburg.

W. B. Gresham, who has been the representative at Cleveland of the Lorain Steel Co., has become associated with the Cleveland office of the Carnegie Steel Co. as a sales agent. Mr. Gresham will be succeeded in the Cleveland office of the Lorain Steel Co. by R. Clitz, of Lorain.

Harry F. Mattern was elected vice president of the Lebanon Chain Works Co., appointment taking effect Sept. 1. He was formerly connected with the American Steel & Iron Co., also of Lebanon, Pa. Previous to coming to Lebanon, Mr. Mattern was associated with the Reading Iron Works, of Reading, Pa.

G. H. Schulte was recently elected a director of the J. I. Case Threshing Machine Co., of Racine, Wis., with which business he will be hereafter connected. Mr. Schulte was vice president and general manager of the Milwaukee Harvester Co. both before and after its being absorbed by the International Harvester Co.

W. A. Miles, for several years superintendent of a foundry in Peoria, Ill., having become interested in the Mackintosh Foundry & Machinery Co., at Monmouth, Ill., has gone to that place and will be hereafter identified with that concern.

Arthur D. Stevens, president of the Merrill-Stevens Co., of Jacksonville, Fla., is now at Coatsville, Pa., placing orders for steel for the work for which his company is under contract.

W. H. D. Totten Jr., who resigned Sept. 1 as manager of sales of the Carnegie Steel Co., at Cincinnati, had held that position 18 years. Mr. Totten came to Cincinnati from Pittsburg to become general sales agent of the company, at which time he was 23 years old. His sucessor will be John E. Woods, of Pittsburg, assistant general manager of sales in that city. This change was noted in *The Iron Trade Review* last week in connection with a number of others.

William Randolph Strickland has resigned from the New York Central railroad and is now associated with J. G. White & Co., New York., as assistant to the secretary. Mr. Strickland is a graduate of the Massachusetts Institute of Technology, and during the Spanish war served at the Mare Island Navy Yard as assistant engineer. For the past year he has been assistant engineer in the maintenance of way department of the New York Central.

The appointment of Robert Bacon as assistant secretary of state not only brings into Roosevelt's administration one of his former classmates at Harvard, but adds to his cabinet one of the most prominent financial figures in the East. Associated with the J. P. Morgan interests Mr. Bacon was instrumental in organizing the steel corporation, the steamship consolidation and the Northern Securities Co., and he is now a director of the United States Steel Corporation, the Chicago, Burlington & Quincy, The Erie, the Federal Steel, the Hocking Valley, the Manhattan Co., the North American Co., the Northern Securities Co. and other great concerns.

OBITUARY.

Patrick Delaney, an expert designer and builder of boilers, and head of the Delaney Boiler Works of Newburg, N. Y., died last week in that city. He was born in Ireland in 1842.

Albert L. Baron, president of the A. L. Baron Manufacturing Co., and for several years a prominent citizen of Brooklyn, died Monday at his home in that borough, aged 55 years.

Albert M. Eddy, a prominent citizen of Chicago, and widely known in the iron industry as the secretary and treasurer of the R. M. Eddy Foundry Co., died suddenly of heart disease Sept. 2 at his residence, 478 West Congress street. Mr. Eddy was 54 years old and was born in Buffalo, N. Y. Ever since being in business he has been connected with the foundry established by his father in 1865. Mr. Eddy was a prominent Mason.

Thomas H. Wells, prominently connected with the iron and coal industry of Ohio, and living at Youngstown, died Sept. 1, after a brief illness. He was born near Dublin, Ireland, in 1814, and came to Youngstown when he was 28 years old. He soon became interested in coal operations in the Mahoning Valley and drifted naturally into iron manufacturing, since which time he has been identified with a great number of propositions in that vicinity. Some of these were the Leadville Coal Mine, the Pittsburg, Bessemer & Lake Erie railroad and the Youngstown Rolling Mill. In 1880, together with Paul Wick, Robert Bentley, Henry Wick and John C. Wick, he entered into the association from which sprang the Ohio Iron & Steel Co.

On the Berlin bourse $100,000,000 3½ percent convertible Pennsylvania railroad bonds and $32,000,000 4 percent first refunding gold mortgage bonds of the Chicago, Rock Island & Pacific railway have been listed.

GREAT DEMAND FOR CARS AND LOCOMOTIVES.

NEW RECORD OF PRODUCTION IS MADE AT THE BALDWIN WORKS.

Pressed Steel Car Co. Receives Large Order from the Pennsylvania—The Pullman Co. in the Market for 2000 Cars.

Within the past ten days, there has been a tremendous increase in orders for cars and locomotives. The Pressed Steel Car Co. received an order for 8,300 cars out of the total orders for 16,000 awarded by the Pennsylvania. It is said that the Pressed Steel Car Co. has now $44,000,000 of orders booked.

Production of the Baldwin Locomotive Works, Philadelphia, for August exceeded all past monthly records, being 230 locomotives. This makes exactly 1,400 since the first of the year.

The Seaboard Air Line Railway Co. has ordered 500 plain box cars and 500 ventilated box cars from the Western Steel Car & Foundry Co. It is rumored that the Erie Railroad Co. is figuring on 2,000 steel underframe box cars and 1,000 steel flat cars. The Southern is reported as being in the market for 1,500 flat cars. The Mexican International Railroad Co. is reported as being in the market for 200 dump cars. The Pullman company has asked prices on material for 2,000 cars.

The American Locomotive Co. has received an order from the Toledo, St. Louis & Western Railway Co. for 15 locomotives. The Canadian Pacific Railway Co., it is reported, will place an order for ten locomotives. The Isthmian Canal Commission is reported as being in the market for additional locomotives. The Minneapolis & St. Louis Railroad Co. is reported as being in the market for ten locomotives. The Iowa Central Railway Co. is reported as being in the market for locomotives.

The Chicago, Burlington & Quincy is in the market for five dining cars. The Central Railroad of New Jersey is asking bids on 50 all-steel hopper ore cars. The Havana Central (electric) has ordered 30 cars from the Wason Mfg. Co. The St. Louis Syrup & Preserving Co., Granite City, Ill., is in the market for 25 steel tank cars. The Nashville, Chattanooga & St. Louis has just completed at its own shops 100 standard flat bottom coal cars. The Muncie & Portland Traction Co., of Portland, Ind., has ordered ten passenger cars from the Cincinnati Car Co. The Lake Shore & Michigan Southern has ordered three combination coach and dining cars from Barney & Smith.

The Seaboard Air Line has ordered ten ten-wheel freight locomotives from the Richmond works of the American Locomotive Co.

The Atchison, Topeka & Santa Fe will order two composite passenger cars. The Chicago, St. Paul, Minneapolis & Omaha is having 500 cars built by the Pullman company. The California & Northwestern is having ten freight cars built by the Russell Wheel & Foundry Co. The Kansas City Southern will probably order 1,000 box cars. The Cleveland, Cincinnati, Chicago & St. Louis has placed an order with the Rodger Ballast Car Co. for one ballast plow car. The London Underground railway has ordered 114 trailer cars and 72 motor cars of the American Car & Foundry Co.

The Pennsylvania Lines West have ordered 132 stock cars, and 579 steel underframe box cars of the American Car & Foundry Co. The Maricopa & Phoenix & Salt River Valley has ordered two coaches from F. M. Hicks & Co. The Central of Georgia has ordered 50 ballast cars of the Rodger Ballast Car Co., to be built by the American Car & Foundry Co. The Southern has ordered three chair cars and two dining cars of the Pullman company and 27 coaches of the American Car & Foundry Co. The New York, New Haven & Hartford has ordered 200 box cars of the Keith Mfg. Co.

The Pennsylvania has asked car builders to bid upon 500 steel underframe box cars, 1,500 steel underframe gondola cars, 1,000 drop bottom steel gondola cars and 1,000 other steel cars. The Boston & Maine has ordered 600 30-ton box cars of the Laconia Car Co. and 500 cars under the same specifications as used by the Merchants' Dispatch Transportation Co. This road has also placed an order for seven passenger cars to be built at the Laconia works.

Merchants' Dispatch Transportation Co. expects to build 250 refrigerator cars between now and Oct. 15.

The Midland Valley has placed an order with the Baldwin Locomotive Works for four locomotives; the Western Maryland and Cardenas & Jucaro have each placed an order with the same company for three and two locomotives respectively. The Midland Steel Co. is having two locomotives built by the American Locomotive Co. The Cuba Co., 80 Broadway, New York, has purchased six locomotives from the American Locomotive Co. J. H. Flick Construction Co., Kansas City, Mo., has purchased from the Atlantic Equipment Co. four 25-ton Brooklyn elevated locomotives. The Canadian Northern expects to place orders during next month for from 30 to 50 new locomotives for next year's delivery. The Missouri & Louisiana has purchased two Forney locomotives from A. C. Torbert & Co. The Illinois Northern has ordered two four-wheel saddle tank locomotives from the Baldwin Locomotive Works for December delivery.

The American Car & Foundry Co. has miscellaneous orders for 50 cars. The Michigan Iron Co., of Detroit, has ordered five flat cars from F. M. Hicks & Co. The Johnston Automatic Refrigerator Co., 418, 263 Dearborn street, Chicago, will arrange for the construction of 250 cars within 30 days. Archer Daniels Linseed Co., of Minneapolis, has ordered two Bettendorf iron underframe tank cars of the Bettendorf Axle Co.

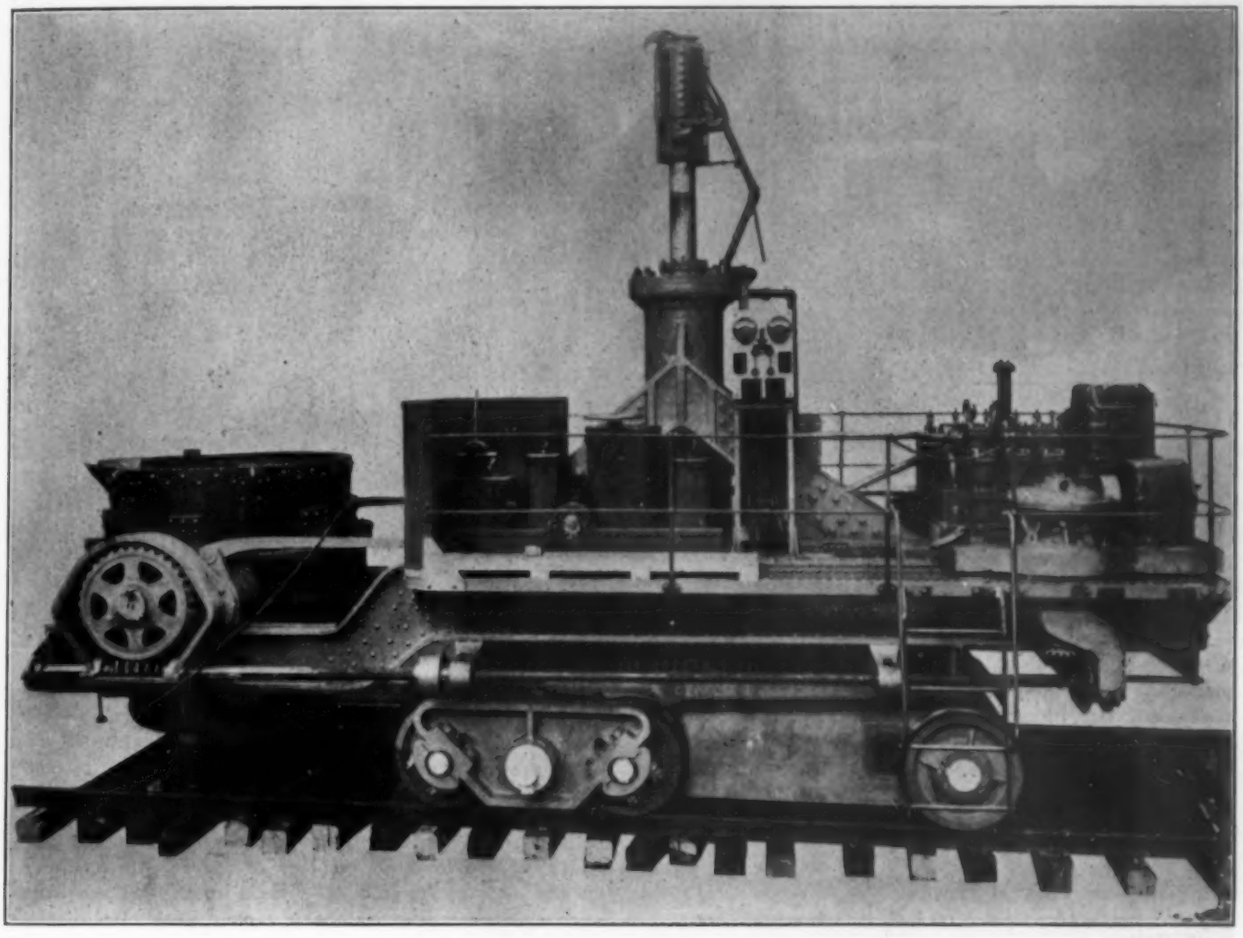
Improvements at the Southern Pacific's Shops.—The Southern Pacific Co. has just completed an extension to its locomotive shops at Sacramento, Cal. This extension, consisting of a building 515 feet in length by 80 feet in width, joins the old machine shop building, the combined floor space of the old and new shops being 515 feet by 180 feet, or 92,700 square feet floor space. The new erecting shop has been equipped with an erecting traveling crane having a capacity for lifting 120 tons, the largest crane of its kind in the West. The crane was made by the Shaw Electric Crane Co. of Muskkgon, Mich. It has a span of seventy-six feet seven inches and the main hoist block has a vertical movement of thirty feet; the maximum speed of the crane on the runway is, with load, two hundred feet a minute, and the speed of hoist with full load is 10 feet a minute. The crane is also fitted with auxiliary hoists for lighter lifts. This improvement brings the Sacramento locomotive shops up to modern requirements. The shops are also being equipped with new, modern tools, made necessary by the introduction of locomotives of high power.

The annual meeting of the stockholders of the Republic Iron & Steel Co. will be held Oct. 18. Transfer books for both common and preferred stocks will close Sept. 21 and reopen Oct. 19 for the purpose of the meeting.

An Electrically Operated Casting Wagon.

BY DR. ALFRED GRADENWITZ.

The electrically operated casting wagon of 20 tons' capacity, shown in the accompanying illustrations, has been supplied by the Benrather Maschinenfabrik, Ltd., to the Burbach Metallurgical Works, in Lorraine. As this wagon has been in continuous operation for some time, and has been found to be free from any drawbacks so far inherent in electrical casting wagons, a short description of it will be of interest.



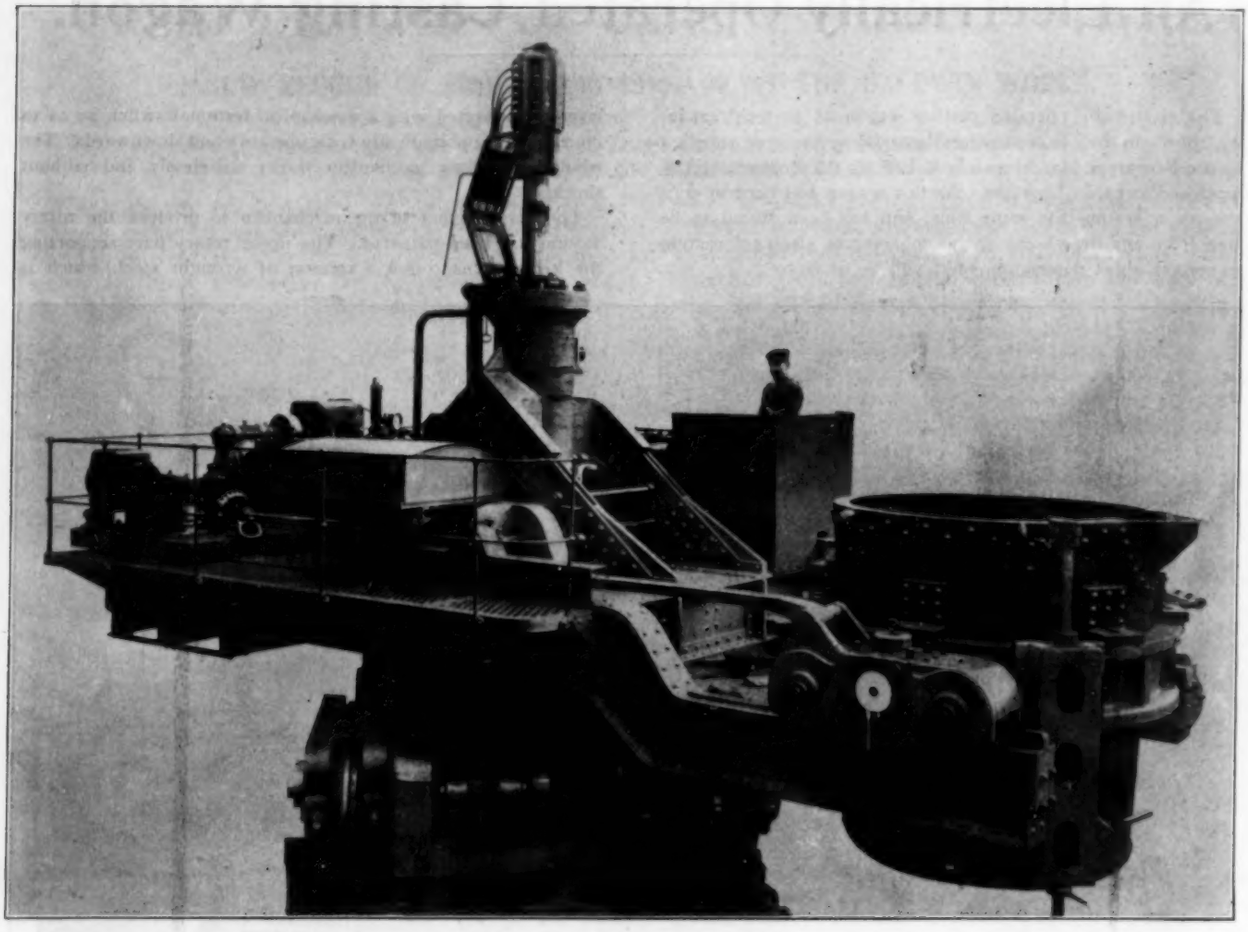
CASTING WAGON RUNNING UPON TRACK.

The construction of a really wear-resisting machine for use in steel works is rather difficult, owing to the dust and steel sparks whch are liable to injure it, and the systems of operation so far usual, even operation by Gall chains, are far from affording the safety warranted by the present construction.

From illustrations it will be seen that the lifting is effected by means of electricity, but through the intermediary of an hydraulic gearing. A slow-running three-plunger pump, operated by a main current motor, and located at the back end of the boom, where it serves at the same time as part of the counterweight, supplies the hydraulic pressure necessary to lift the boom, together with the ladle. The pump draws water from a tank, discharging it immediately into the lifting cylnder, so that with each lift of the ladle, the motor is started under load, and after the completion of the lift is stopped again. The number of revolutions of the motor, and accordingly the performance of the pump, is controlled at will by inserting resistances in the usual way. The controller lever is connected with a mechanical terminal switch so as to limit the lift automatically both upwards and downwards. The whole controlling mechanism works noiselessly and without shock.

The arrangement of the mechanism to produce the rotary motion has been patented. The upper rotary part supporting the kettle turns round a column of wrought steel, which is located in a heavy cast iron truck. A plunger, which is free to rotate round the wrought iron column, carries at its lower end a strong rotating toothed wheel, consisting of two parts and being fixed rigidly to the plunger. On this rotary plunger there is arranged the lifting cylinder which is so located that the stuffing boxes are entirely free from any lateral pressure, the plunger above the column having a rectangular cross section with which the cast iron nave, fitted into the wrought iron boom engages. The rotation of the plunger is produced by a motor installed in the truck, and is transmitted to the transversal beam through a quadrangular piece, thus doing away with any rivets or spring and leaving fixed the readily accessible lower stuffing-box, which does not take a part in the rotation in regard to the plunger.

To produce the various motions, individual electrical operation has been made use of throughout, thus ensuring great simplicity in the arrangement of the driving mechanism and facility of control of the whole machine. Four independently-



CASTING WAGON TURNED FOR POURING.

controlled motors have thus been provided for the various movements, viz., lifting, rotating, displacing and tilting the ladle. To ensure the interchangeability of duplicate parts, motors of the same capacity (14 h. p.) and construction have been chosen both for rotating, tilting and displacing the ladle; these motors are series-wound and of the enclosed type, to protect them against steel sparks and dust.

The traveling mechanism of the truck, of which only the back axle is a driving axle, has been designed according to a special system. On account of high traveling speed of the casting wagon (80 to 90 meters per minute), necessitating 80 to 90 h. p., the use of two motors was found suitable. As these two traveling motors of 40 to 45 h. p. each, with 486 r. p. m. of the armature, were to be arranged beside one another their breadth was not allowed to exceed 420 mm., the gauge of the track being 2,600 m. These conditions were readily complied with, thus showing the ease of adaptation of the electric motor. The driver's stand has been so arranged as to allow of the casting pit and track being readily inspected.

The capacity of the ladle, as above mentioned, is 20 tons, the maximum projection being 3 meters and the vertical lift of the kettle 800 mm.

More Erie Improvements.

Approximately $4,000,000 will be required to build the Genesee River railroad, recently incorporated by officers of the Erie railroad. The new road is to be thirty-four miles long and will extend from Hunts, a small station near Portage, in Livingston county, on the Buffalo division, to Cuba, on the main line. Between Hornellsville and Cuba there are two very heavy grades, each reaching about 50 ft. to the mile, which must be surmounted. The construction of this short line will give a grade of two-tenths percent—practically a water-level route, as the grade on the Buffalo division from Hornellsville to Hunts exceeds that but little.

The line is intended to be used chiefly for freight traffic and will add much to economy of operation by permitting heavier train loads and so utilizing to the best advantage the improved rolling stock now rapidly being placed on the Erie. This new cut-off is supplemental to that which cuts out the heavy grades in the vicinity of Middletown, where work on a double track freight line has already been begun—this improvement when completed will cost $10,000,000.

Defective Rails Not Scrap Steel.

The United States circuit court for the eastern district of Louisiana has decided that defective steel rails cannot be imported as "scrap steel" under the provisions of the Dingley tariff law.

The case concerned the importation of rails made by the Illinois Central railroad in 1903. The rails were from 12 to 16 ft. in length and cut nearly in two. Although they were perfectly new, they were by reason of certain defects below the usual value for rails of that kind. They were returned by the appraiser at New Orleans as "rails" with a duty of 7-20 of one cent per pound. The importers claimed that the material was dutiable at $4 per ton under the provision for "scrap steel, fit only to be manufactured." The board of United States general appraisers decided that the articles had not lost their identity as rails, and the circuit court now affirms the action of the board and condemns the importers to pay the costs of the proceedings.

CAMERON PUMPS FOR ICE MAKING AND REFRIGERATING.

Probably one of the most severe tests of pumping machinery was made by the Ice & Cold Machine Co., at the ice making and refrigerating plant, Louisiana Purchase Exposition, St. Louis, Mo., during the entire period of the fair. Fig. 1 shows two Cameron boiler feed pumps, 8 x 6 x 13 inches, installed in the boiler house, and used for supplying two water tube boilers of 750 h. p.

Fig. 2 shows two 10 x 9 x 18 in. Cameron special brine circulating pumps, of the light service pattern, having long bodies and composition linings, which were also in operation at the above mentioned plant, and were used alternately in the refrigerating pipe line, which was claimed to be longest continuous line in operation using brine as a refrigerating agent. These pumps were in constant use day and night during the entire time of operation or from May 14, 1904, to the close of the Exposition on December 3 (of the 500-ton refrigerating machine, with the two ice tanks capable of making 120 tons of ice daily, and cold storage space of 100,000 cu. ft.).

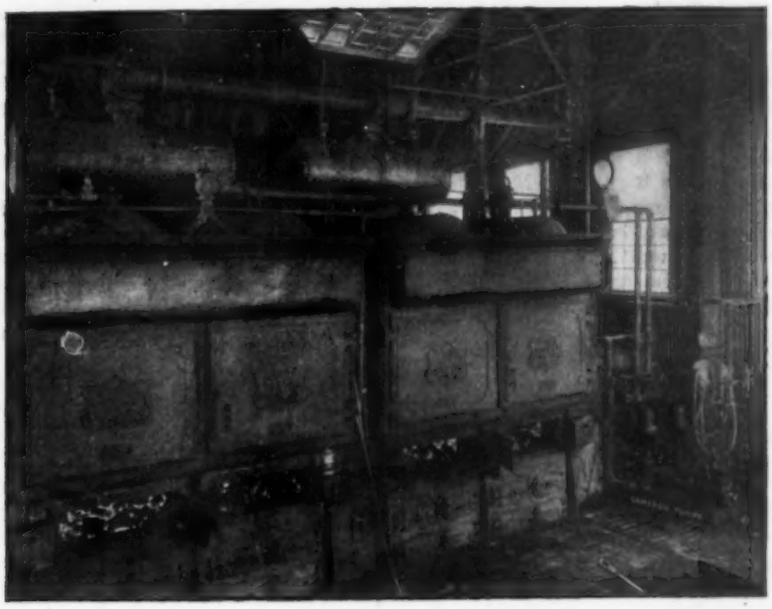


FIG. 1.— CAMERON BOILER FEED PUMPS.

brine at a temperature of 10 degrees above zero was put into the pipe line and pumped through the various and numerous refrigerator boxes, containing 60,000 cu. ft., at the German Tyrolean Alps, 7,000 ft. distance from the plant; the brine traveling through the pipe a distance of over 14,000 ft. after leaving the pumps, before returning to the brine coolers.

These pumps required but little attention from the busy engineers, and withstood the severe strains to which they were subjected, owing to their high efficiency, perfect design and thorough construction. Having automatic governors, they maintained continuously a constant pressure in the service pipe line, thereby making a uniform and regular feed to each and every refrigerating coil connected to the line; and they were so designed and constructed as to permit of the instantaneous opening of any of the large valves without detriment to the steam or brine cylinder heads.

The pipe line was used by other parties for refrigerating between the above mentioned points, but the connections and arrangement were such that no difficulty was experienced in getting proper circulation and without interfering with other boxes on the line. Adverse circumstances were experienced in putting in the line, owing to its location and the weather conditions. Sewers, electric conduits, water, gas and fire line service pipes, had to be crossed over or under, or the line laid parallel with them in many places; to say nothing of having swampy grounds, railroad crossings and minor difficulties to contend with. Many curious conditions were noted in operating the line, owing to the fact of sewer breaking and emptying their contents on the line, heavy rains getting into the insulation and numerous other articles to overcome.

The plant was open day and night continuously from the opening to the closing of the Exposition, and thousands of visitors inspected it; many of them were familiar with the use of the Cameron pumps under different and even more trying conditions. The pumps presented a very unique and picturesque appearance, owing to their being covered with a layer of frost.

There is no reason why similar plants could not be used in large cities and refrigeration be sold in place of ice.

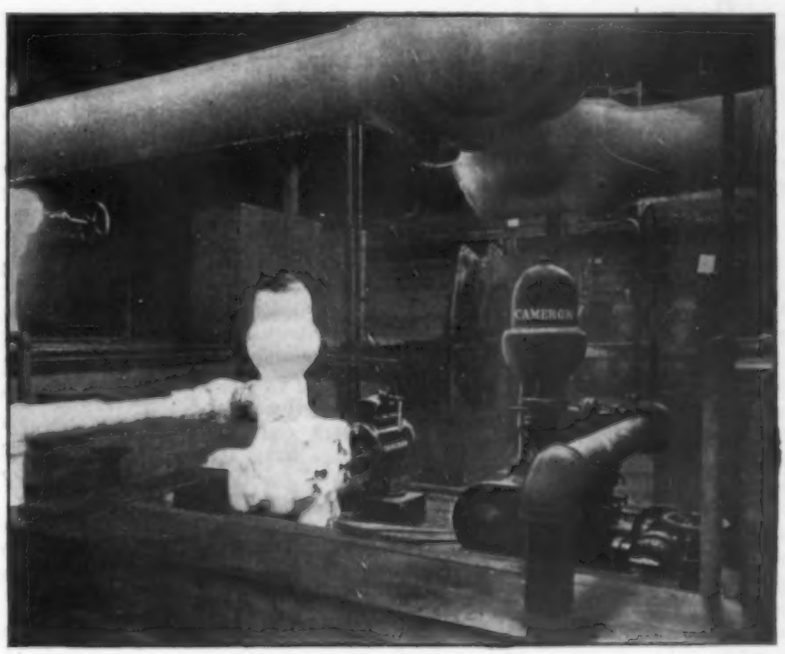
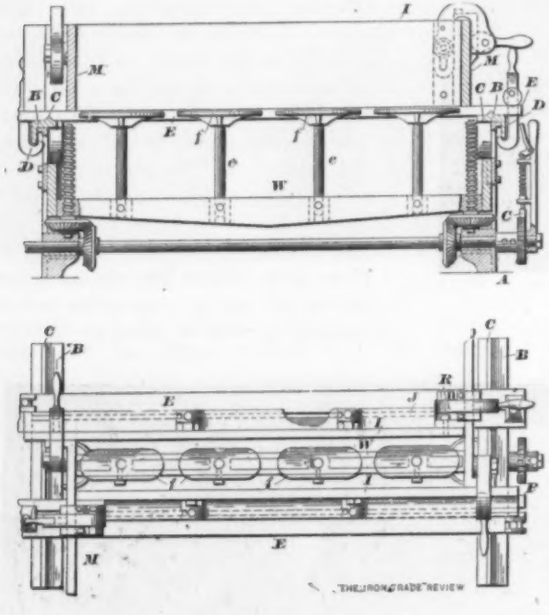


FIG. 2.— CAMERON BRINE PUMPS.

A NEW MOLDING MACHINE.

A molding machine is the invention of Edward L. Stevenson. The main object of the invention is to provide an expansible mold for molding machines, the size of which may be varied as desired, and the opposite sides of which will be maintained in parallelism at all times. The construction is such that the sides and ends of the mold are always held in a vertical position with relation to the bed of the machine, so that the parts may be quickly clamped to each other and to the bed, when the desired adjustment as to the width and length of the mold has been obtained. A further object of the invention is to provide a device for elevating the false bottom or platen to a point slightly above the upper edge of the mold, so that the platen, with the molded block thereon, may be moved laterally from the apparatus, as is now the usual practice.

The end frames or supports AA of the machine carry a horizontally-disposed member B, having a track or way C upon its upper face and being also formed with a downwardly-extending flange or web D. Mounted upon B are two slides or supporting members EE of such length that they project slightly beyond the members B. Members E are provided with suitable grooves upon their under faces, the grooves conforming with ways C of mem-



A NEW MOLDING MACHINE.

bers B, so that when the parts are unclamped said members E may be moved laterally upon the members B to any desired extent, the guides or ways maintaining the same in parallelism.

J-shaped clamping members are carried by the outer ends of members EE, the lower end of each clamping member extending inwardly below the web or flange D. The parts are drawn together by cam-levers, pivotally connected to the clamping members F and bearing upon the members E. Each supporting member E is provided in its upper face with an undercut groove or channel, which extends from end to end of said member. The members B form, in effect, the bed of the machine, the supporting members mounted thereon in turn carrying the adjustable mold. Mounted upon each of the said members E and extending longitudinally are the mold sides I, I, each of which is provided with a lateral extension or foot piece, overlying the undercut groove or channel H. A series of holes or openings is formed in each foot-piece, and bolts extend through said openings, the head of the bolts being placed in grooves or channels H. To the upper end of each bolt is pivotally connected a cam-shaped locking lever, which, when turned into an upright position, serves to draw the bolt upward and to force the member J downward upon the supporting member E, thereby securely clamping the side of the mold in its adjustable position.

The sides I are straight throughout their length and co-act with end plates M. Each end plate is provided with a lateral offset or bearing-plate, which bears against the inner face of the corresponding side piece. The clamping of each bearing member to the corresponding side I is effected by means of a U-shaped clamp, one end of which is slotted and connected to the end plate M by a bolt. The other end of the clamp is provided with a cam-lever, which bears against the outer end of each side wall or member. The other end of each side member I is secured to the corresponding end plate or member M by means of a U-shaped clamp, which is slotted at one end and connected to the side member by a bolt. The opposite end of the clamp is provided with a cam-lever which bears directly against the outer face of the end plate M. In order to prevent separation of the side members I and end plates M, when the parts are released for adjustment, fingers are employed, which are connected to castings, carried by the side members I.

The mechanism for bodily elevating the platen, with the molded block thereon, comprises a cross-beam W, the ends of which are provided with internally-threaded openings through which pass screw-shafts, each shaft carrying a bevel-pinion at its lower end. These pinions are in mesh with corresponding pinions mounted upon a shaft which is journaled in suitable bearings formed in the end supports A. A hand-lever is loosely journaled upon the outer end of the shaft and carries ratchet mechanism, which engages with a toothed disc, secured upon the shaft. By means of this lever and wheel the shaft may be rotated in either direction, so that the beam W may be raised or lowered, as desired. Carried by the beam is a series of posts or uprights *e*, each having at its upper end a bearing-plate *f*, upon which the platen rests squarely. When the beam is elevated the platen will be moved out of the mold, so that the block mounted thereon will not be distorted or broken. The uprights *e* are adjustable in the cross-beam, so that their position may be shifted as the form of the mold is changed, or some of them may be removed if the mold be contracted.

A New Engineering Partnership.—A partnership, under the name of Frazier, Fox & Spencer, with offices at 718 Rockefeller Building, Cleveland, has been formed for the purpose of acting as consulting engineers on designs, estimates, specifications, examinations, reports, etc., on bridges, steel frame buildings, light, heat, power and industrial plants, and also on warehouses, docks and terminals. The gentlemen composing the partnership are J. W. Frazier, associate member American Society of Civil Engineers; J. H. Fox, member American Society of Mechanical Engineers, and J. C. Spencer, member American Society Civil Engineers. Messrs. Frazier and Fox have been connected for about six years with the Brown Hoisting Machinery Co., of Cleveland, in the designing and contracting department. Mr. Spencer for several years was connected with the engineering and designing department of the American Bridge Co. For the past year he has been practicing as a consulting architectural engineer with offices in Cleveland.

ALUMINUM AS A PATTERN METAL.

H. N. TUTTLE.

There has been so much said against aluminum for metal patterns, that those who have never used the metal for that purpose would be naturally inclined not to give it a trial; whereas, if one has thoroughly investigated the matter, he finds merits in it, which make it the metal "par excellence" for many classes of metal patterns.

In the first place, its extreme lightness is a very valuable feature. The specific gravity of aluminum is 2.56, while that of brass is about 8.32, and zinc and tin alloy or antimony and tin about 7.25. From this will be seen that with a given size gate, aluminum patterns of three times the volume of brass or soft alloy patterns may be carded with only the same liability of breaking the soldered joint. So, in considering patterns of the same size, carded with gates of the same size, the danger of breaking the joints of the aluminum card would be very much less than that of the other.

Molders like aluminum patterns on account of it being so much easier to draw a light pattern than a heavy one.

The cost of the metal is less than that of almost any other pattern metal. Aluminum costs about thirty cents per pound, and as its volume is three times greater than brass or other pattern alloys, its comparative cost is reduced to ten cents per pound.

It is sometimes said that the sand sticks to aluminum patterns more than to other kinds, but after examining about three hundred cards of various metals, to observe the amount of dirt remaining on the patterns after they were brushed off, and after talking with several of the molders who have used these patterns, it was found that it was not true, in this shop at least; there being no appreciable difference in this respect.

Aluminum finishes with the file, sand paper, scraper, etc., much easier than brass or the hard pattern metals, and casts smoother than the soft alloys. It is very stiff and will not easily spring out of shape nor be easily bent, making it better for light, flimsy patterns than the soft alloys; while, on the other hand, it is somewhat soft, so that it will not peen out of true from rapping, as flat, thin iron patterns do. Still, if an aluminum pattern be sprung slightly in casting, or in any way, it may be trued up by bending, though it will not bend so much as brass.

Of course, it is not claimed that aluminum is better for all classes of metal patterns, but for ordinary carded work for castings not requiring extreme accuracy or fine surface, such as agricultural and light machine work in general, and for single patterns too large to card, as gears, hand wheels, etc., it makes durable, cheap, and easily finished patterns.

Soldering Aluminum.

The objection most often heard to aluminum as a pattern metal is that "it can't be soldered," or that "it is extremely difficult to solder," or that "a good joint can't be soldered." Now it is proverbially hard to prove a negative, and it is especially true in this case. The chief difficulty in soldering aluminum lies in not knowing how. It is not generally known that a fair job of soldering can be done upon aluminum with common half and half solder, but such is the case. We have patterns which have been in use a long time upon which are shrinkage holes soldered with the common solder. It is only necessary to follow the directions given below for using aluminum solder, using no flux. Also, aluminum with 10 percent tin added will solder better with common solder. However, a special aluminum solder is much better, making a stronger job, and being easier to use. We have been experimenting and testing aluminum solders for several years, and have found the one below to be the best, considered from all points, for metal pattern work. It is sligthly different in color from aluminum, which makes it useless for ornamental work, but it is cheap, easy to use, and very strong and durable. We have made test joints with it which have stood more strain than the aluminum itself, the casting breaking at one side of the joint, though, of course, this is not usually the case. The receipe for this solder is as follows, all parts to be measured by weight:

Aluminum	1 part
Phosphor-tin	1 part
Zinc	11 parts
Tin	29 parts

In making this solder, melt the aluminum first. Then add the zinc in small pieces, so as not to solidify the already melted aluminum. Then add the tin, taking the same precaution not to solidify the metal, and lastly, drop in the phosphor-tin, stir well with a brass rod, and quickly pour into molds, which may be easily made in the open sand. Use a crucible in making this solder.

The reason for observing the above order of melting is that if the metal with the lower fusion point were melted first, and then brought up to the temperature necessary to melt the aluminum, the lower metal would be over-heated and partially vaporized, thus destroying the proper proportion.

In regard to using the solder, it is well to understand a few points about aluminum oxide. This oxide is a thin film or skin which forms upon the surface of aluminum immediately upon its coming in contact with the air. This oxide forms practically instantaneously, so that if a scraper or other instrument be pushed across the surface of the metal, the oxide forms before the bare metal comes in sight. It also forms upon the molten metal, and it sometimes happens in pouring, that the workman finds he is pouring his metal through a tube of oxide. It also sometimes happens that when he over fills his flask, and the metal runs over the side, in the case of heavy casting, a film will form around the overflow, and siphon quite an amount of metal from his sprue, unless he prevents it by breaking the skin.

The oxide is very durable and impervious, so that it prevents the air from reaching the inner metal, and thus further oxidization is very slow. In the case of iron, the oxide is, we might say, very porous, so that the first thin layer of oxide has little effect in reducing further oxidization.

It is the presence of small scales of oxide through the body of the casting, which renders the metal porous, and unfits it for pump work, upon castings which are subjected to hydraulic pressure.

Now solder will not adhere to any metal covered with oxide. In the case of brass, the oxide is removed by the flux, but there has been no flux discovered which will remove or dissolve aluminum oxide. However, the difficulty is overcome in a very simple way. The soldering copper, which should be a rather heavy one, and untinned, is heated to a dull redness, and then rubbed back and forth upon the surface to be soldered, melting the solder upon the hot copper at the same time. The surface becomes covered with the melted solder, which excludes the air and prevents further oxidization, while the point of the copper scratches off the oxide already there. Under these conditions the solder readily adheres to the aluminum, and the surface becomes "tinned." For filling shrinkage holes, or building up additions upon patterns, all that is necessary now, is to melt in the required amount of solder.

In case it is desired to solder two pieces of aluminum together, both surfaces should be "tinned," the pieces brought into position and the joint heated with a copper

or blow-torch until the solder is liquid, then pressed into place and allowed to cool. Brass must be heated to 460° before solder will adhere to it, while aluminum must be heated about 200° higher, so it will necessarily be a little harder to solder aluminum than brass.

There is a certain stage during the cooling, just before solidification, when the solder may be worked into any shape, at will, like snow, when it is right for packing, or like the amalgam used by dentists. Of course this temperature is hard to maintain, but the temperature at which aluminum "tins" nicely, is nearly at the "wiping" temperature, as a plumber would say, and on this account there is time enough to "strike off" surplus solder, in simple cases.

As an example, suppose it is desired to "build up" a certain surface of a pattern, one-half inch. First "tin" the surface to be "built up." Then place a wooden frame around that part of the pattern, so that its upper edge is in line with the desired finished surface. Then melt in with the copper enough aluminum solder to fill the frame "heaping full." After rubbing the copper over the bottom and around the corners, to be certain that the solder is melted into the "tinned" surface below, when the solder cools to just the right temperature, "strike off" by "patting" with a block of wood, using the top of the wooden frame as a guide. Sometimes the "striking off" can be better done with a piece of smooth steel, like a scraper.

Fillets may be "wiped" in corners with a common waxing iron with nearly as much ease as wax fillets. The corner, after being "tinned," has a little solder run in, and immediately followed by the waxing iron, which if done at the proper moment, presses the solder into shape, leaving it as smooth as glass, and requiring no further finishing.

These are merely simple examples of what may be done in the line of "striking" solder. In case of any larger or complicated jobs, it is better to rig up some kind of heating table, so that the temperature of the casting may be maintained.

Sometimes additions may be more easily cast on than soldered and swept off. In this case the addition may be put upon the pattern in wood, wax, or in any convenient way and the pattern rammed up. After the pattern is drawn and the addition removed, the proper surface is tinned and the pattern replaced in the mold. After the mold is closed, the addition is cast on by pouring in melted aluminum solder at a high temperature. Gates which have been broken off are sometimes replaced in this way.

Casting.

Another objection to aluminum often heard is, that "it is hard to cast." However, it is only necessary to observe a few conditions to make the casting of aluminum as certain as that of any other metal. It should be borne in mind that aluminum melts at a higher temperature than soft alloys (about 1200°), is much lighter than any other pattern metal, and has the property of absorbing gases when over-heated, or when kept in a molten state for any length of time. On account of these properties, aluminum should be handled somewhat differently than the other metals.

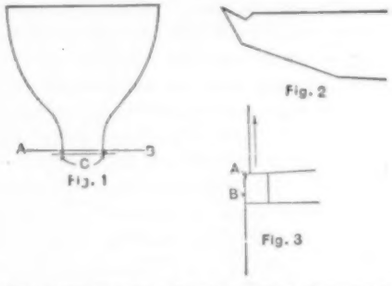
The most important thing to remember is to use a large sprue and a large gate, so that as the casting chills, it may "draw" from the metal in the sprue, and thus not leave shrink holes in the casting itself. For this reason the gate and sprue must be of such size that they will remain in a liquid state longer than any part of the casting proper. After a little practice, the workman will be able to judge how small a gate it will be safe to make for any given casting. However, it is better at first to be on the safe side with the larger gate, as it is cheaper to saw off a little more metal than to solder a shrinkage hole.

As a general rule, it is better to gate into the heaviest part of the casting, as this is the part which cools last. If it is difficult to do this, or if there be more than one heavy or enlarged part to the pattern, "risers" may be put on to feed in the shrinkage. It is absolutely necessary to put a riser on any heavier part of the casting, which is separated from the gate by a thinner section, to prevent a shrinkage.

On account of its lightness, an extra "head" is not of so much advantage as in other metals. From the same characteristic, top gating may be more often employed, as its lightness very greatly reduces the probability of "washing."

Pulley patterns, sprockets, small gears, etc., may be best cast by setting the sprue upon the cope print, or on the hub.

The form of sprue to be recommended for top pouring is shown in Fig. 1. This form gives a larger body of metal for the same size gate, than the ordinary shape. If, after the cope is lifted off, the sand is pressed or cut back as shown at C, the sprue may be broken off at the line A and B, without the use of a saw.



SPRUE AND TOOLS FOR WORKING ALUMINUM.

The sand should be tempered as dry as can be conveniently worked, as the metal is so light that it cannot overcome the steam pressure as well as a heavier metal, and blows are more apt to be caused from wet sand than in any other way. This is especially true in case of "pockets" of sand in the drag, surrounded by metal. This makes it sometimes necessary to vent down to the bottom board, to prevent a "blow." Another essential point is to pour the metal at the proper temperature. The rule is, "to pour at the lowest temperature that will fill the mold," which in most cases is but little above the melting point. The most convenient way for testing the temperature, is to place the end of a pig of aluminum about three-quarters of an inch into the molten metal, and allow it to remain there a short time. If the metal is "hot," its degree may be determined by the rate at which it melts the pig. If the metal is near its melting point, a little cup of the congealed metal will be formed around the end of the pig. After the pig is withdrawn, the time it takes for this "cup" to become remelted, will give a very accurate idea of its temperature. After losing a few castings by pouring too cold, the proper heat may be easily judged.

As the metal is poured at such a low temperature, it is always well to ram the sand as lightly as the mold will stand, to allow the easy escape of the air and gases, but should it be necessary to ram the mold hard, it should be thoroughly vented. Another reason for ramming lightly, is that the property called "hot-shortness" is very much in evidence in the case of aluminum. That is, the metal is very weak, just after solidification, so that in certain shapes, such as an open ring, if the sand is rammed very hard, there will not be sufficient strength to the

casting upon shrinking, to crush in the sand; the result being a broken casting. The remedy lies in proper ramming.

For this same reason, it will be found safer in casting around cores of more than three or four inches in diameter, to use a soft baked core made of molasses water and molding sand. This crushes as readily as green sand Also the castings should not be shaken out too quickly after pouring.

Since aluminum has the property previously mentioned, of absorbing gases when in a molten state, it should be poured soon after melting. It should not be allowed to remain in the fire and "soak," as the gases absorbed tend to produce blow holes.

The metal should be poured very rapidly, literally "dumped" into the mold. This will help fill the mold, when otherwise the metal might be too cold to run up into the cope corners.

For melting the metal, a gas furnace is the most convenient outfit. Catalogues describing these may be obtained at any gas company's office.

Coke makes a very good fuel, especially if there be much casting to be done at one time. Charcoal is inconvenient on account of its burning out so rapidly, though it is a very clean fire.

Soft coal is not to be recommended, as it is dirty and gaseous, but for a quick short job, it is very good. When it is used, care should be taken not to get any particles of the fresh coal into the melted metal just previous to pouring, as these make small blow holes, slightly below the cope surface. Though these generally remain below the depth of a file cut, they will show if the casting be finished in the lathe.

An iron ladle, or black lead crucible may be used, an iron ladle being rather more convenient, but burning out in the course of a few months' usage. In either case it is more convenient to use a ladle or crucible large enough to hold all the metal a man can handle. Also there should be a long sand-bin with a goodly quantity of sand, so that the patternmaker can ram up several molds, and pour all at once, immediately upon the metal in the large pot becoming melted. Of course this last applies merely to small shops.

Snap molds need not be jacketed in case of light castings, and seldom need weighting or clamping to hold down the cope.

If the castings be shaken out soon after they are poured, and a shrinkage hole should be found, which will be rare if the above rules are followed, it may be easily filled by rubbing a stick of aluminum solder upon the proper surface, while the casting is still hot enough to melt the solder. Yet the casting should not be too hot, as the solder will merely run into the casting itself.

A 3-16″ shrinkage rule is the proper rule to use, though the shrinkage will vary from this slightly under different conditions.

The gates for aluminum patterns should ordinarily be made of rolled sheet brass, cast in as in soft alloy patterns. An anchor hole should be drilled in the end of the brass, as the aluminum will not weld to the brass. It is well to use brass about one-eighth of an inch thick for gates when possible. When very heavy patterns are gated, the aluminum sometimes melts the end of the brass gates, causing blows in the casting, and loosening the gate. This trouble may be overcome by using sheet phosphor-bronze in place of brass.

Finishing.

One of the greatest advantages of aluminum for patterns, is that it finishes so easily. A few points will be touched upon here. For sawing off sprues, which cannot be safely broken off, a common hack saw is generally used, but a fine tooth panel saw, about fourteen inches long, sharpened hack saw style, or like a wood rip saw, is much better, as it saws faster and more accurately. An old fine tooth circular saw is sometimes used where there is much sawing to be done. Regular metal cutting circular saws and metal cutting band saws may be bought which do very rapid work.

Aluminum files nicely, the scale not being appreciably harder than the inner metal. It has a slight tendency to "pin up" on the file, and scratch, this tendency varying much with the individual file, and with different castings, some files not "pinning" with any casting, and some castings not "pinning" with any file. This tendency may be overcome almost entirely by dipping the file occasionally in water. Some workmen say that this makes the file cut much faster, also.

There is a file made with a very oblique cut, which will not fill up with even the softest metals. This is a bastard cut file, the main cut being made on an angle of only 40° with the side. The second cut is made very light. This file works very nicely upon aluminum and is generally used by the writer.

Much of the finishing may be done upon the disc grinder. Should there be none in the shop, a fairly good one may be made by covering a large wooden face plate with garnet paper, running at quite a high speed in the turning lathe.

For finishing inside cylindrical surfaces, such as journal bearings, sand-paper rolls may be made and used in the lathe. It is well to have several of these rolls of various sizes on hand.

By using the finest grade of Albany sand (Windsor Locks sand is often used) and taking care in the molding, very smooth castings may be produced, which may be very quickly finished well enough for common work upon the rotary wire scratch brush. This may be purchased for about ten dollars, and put upon an emery wheel arbor, and run at a high speed.

When using hand scrapers, or floats, and when drilling, tapping or turning, kerosene may be used as a lubricant. Of course water or benzine would be as good, but water rusts the machines, and benzine or naphtha evaporate rapidly and are unpleasant upon the hands.

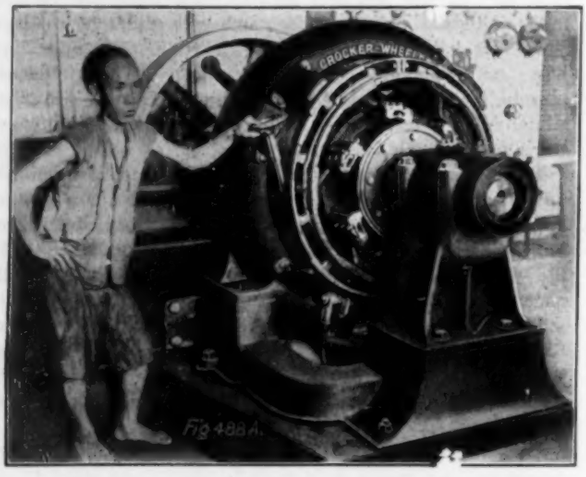
The proper speed for turning is about the same, or a little less, than that for brass, while the tools should be ground with considerable rake and clearance, about the proper amount being shown in Fig. 2.

The top view of a very nice working lathe tool is shown in Fig. 3, in which the feed is in the direction of the arrow. The round corner A makes the roughing cut while the flat edge B, the finishing cut, both at one operation. By grinding tools this shape, 1-32 of an inch is about all the stock that is necessary to allow for turning. Turning tools should be placed at or slightly below the center of the work.—[The Foundry.

The University of Wisconsin, Madison, Wis., has issued bulletin No. 121. This is devoted to the College of Engineering, and describes the course given in chemical engineering. This is a new course at Wisconsin and will begin in the fall of the present year. Mr. Charles F. Burgess, E. E., is appointed professor of applied electro-chemistry, and O. W. Brown, M. A., instructor in applied electro-chemistry. In addition to these gentlemen the regular staff of the department of chemistry of the university will give instruction. The purpose of the chemical engineering course is to thoroughly train students in the fundamental principles of both chemistry and engineering, and to give such other subjects as will so far as possible contribute to a liberal education.

AMERICAN DYNAMOS IN AN ORIENTAL PRINTING HOUSE.

The accompanying photograph was taken in the power plant of the bureau of public printing at Manila, P. I. Mr. Earl L. Tatum, electrical engineer in charge of the plant, is the person to whom we are indebted for the picture. The plant includes two standard 50 kilowatt Crocker-Wheeler electric generators, one of which was installed in 1901 and the other



CROCKER-WHEELER GENERATOR IN THE PHILIPINE ISLANDS.

in 1904. These machines are so simply designed that after being shipped half way round the world they may be operated by natives whose mechanical experience seldom comprehends anything more intricate than a wooden plow.

Mr. Tatum quotes the Filipino shown in the picture as saying, "Me saber Crockerne-Whelen electricidad maquina," which being freely interpreted, means "There is nothing I don't know about Crocker-Wheeler machines."

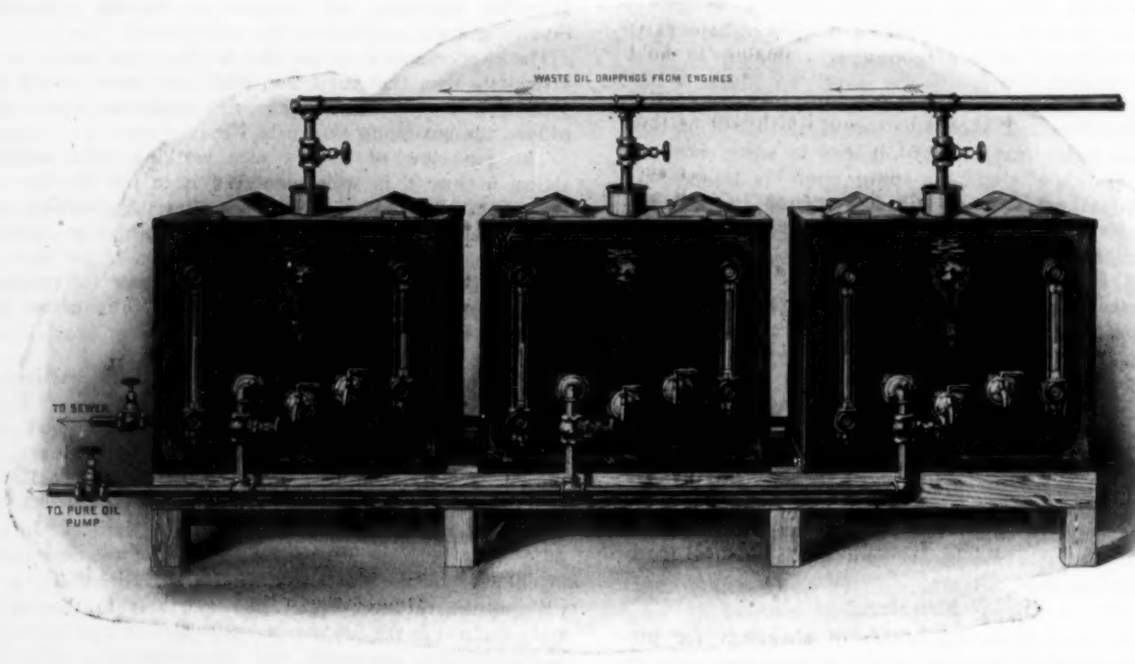
A "UNIT TYPE" OIL FILTER.

The Burt Mfg. Co., Akron, O., has recently brought out a system of filtering oil in which a number of separate units may be connected to filter the oil used in a large plant. Each unit is independent in itself, and new units may be added as the plant grows, thus keeping capacity of the oil filter system up to the size of the plant.

A sectional view of a single unit is shown in the accompanying illustration. The dirty oil enters the waste oil receptacle and passes through the small perforations, flowing thence horizontally to the two filtering cylinders, and in passing into these two cylinders, the heavy impurities fall by gravity into the sediment pan. They are thus disposed of and do not clog the filtering cloths or filtering material. The filtering cylinders are wrapped with cloths through which the oil passes before entering the cylinders. The cylinders are filled with a quantity of animal bone-black, through which the oil must flow before entering the two tubes which lead from the cylinders to the bottom of the filter. Two plates are attached to the bottom of the tubes and the oil is spread out in a very thin film by means of these plates. It is thus thoroughly washed by the water in the filter and any remaining impurities in the oil drop to the bottom of the filter and can be flushed out at any time desired by simply opening the gate valve, which connects with the sewer.

A hot water chamber surrounds the upper part of the filter, which contains the filtering mechanism. The water in this chamber is heated by a small steam coil which is fed with live or exhaust steam, from any convenient source. The oil is thus heated before filtering and flows more freely, thereby increasing the speed of filtration and the filter capacity. When the dirty oil is heated it spreads out and most of the dirt and grit then falls into the sediment pan. The bulk of the sediment in this type of filter is at the top, where it can be readily removed without interfering in any way with the supply of pure oil for the oiling system. The maker guarantees that the filter will handle successfully the heaviest grades of oil, such as lard, gas engine and cylinder oil.

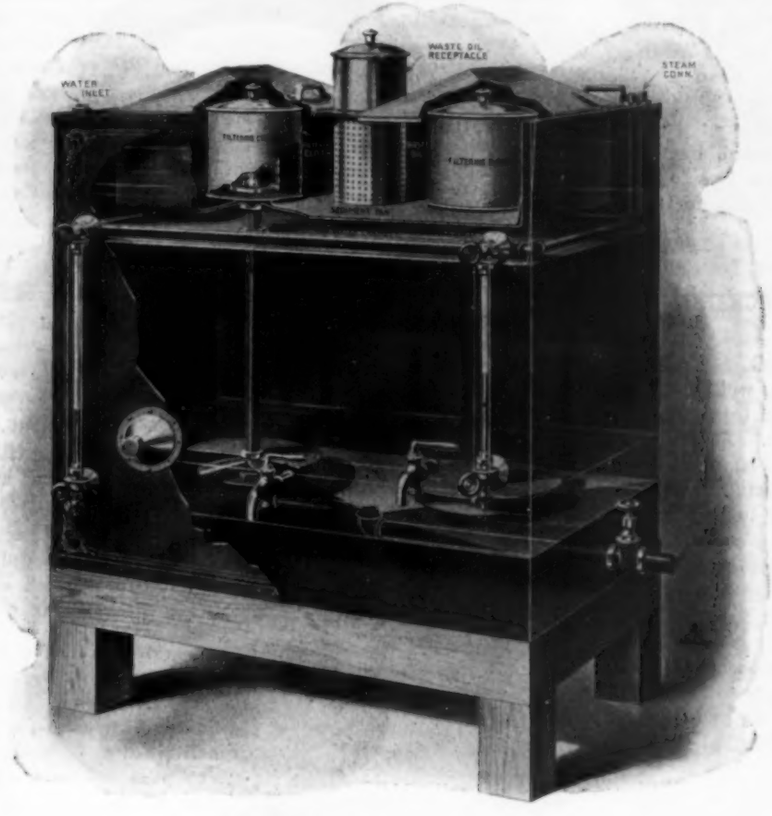
In the construction of the unit type of filter heavier iron is used than in the regular type of filter, and the body is



OIL FILTERING PLANT CONSISTING OF THREE UNITS CONNECTED TOGETHER.

riveted to a heavy wrought iron frame. All seams are lapped, riveted and soldered. The upper and lower part of the filter cylinders are made of cast iron, nickel plated on the top. The tubes leading from the filtering cylinders to the bottom of the filter are of wrought iron. The filter is painted dark blue, decorated with gold, and is an ornament to any first-class power plant.

The filters are so constructed that they may be used with or without an oiling system. They can, if desired, be installed and operated at first without being connected with an



SECTIONAL VIEW OF OIL FILTER UNIT.

oiling system, and later on, if an oiling system is added to the plant, pipe connections can readily be made to the filter at slight expense.

It is not necessary to shut down a system and disconnect pipe connections in order to clean the filter. If more than one unit is used it is only necessary to shut off the flow of oil to the filter to be cleaned, the other units being able to handle easily the extra amount. When only one filter is installed, the cloth around one cylinder can be removed instantly, and if the filtering material also needs to be removed, one cylinder is unscrewed and a plug which is furnished for the purpose is screwed into the tube, so as to keep the dirty waste oil from flowing into the filter. The other cylinder continues in operation while the first is being cleaned.

Any type of filtering material can be used in the cylinder, such as white waste, sponges, excelsior, raw wool, etc. The manufacturer recommends the use of animal bone-black which is in use in all oil refineries for purifying oil. This material can be washed with hot water or gasoline and used many times. Filtering cloths may also be used to purify the oil. As any number of cloths may be wrapped around the filtering cylinders and in changing them nothing but the cloths need be removed, the cloths can be removed while the filter is in operation without changing or touching any pipe connections.

This type of filter is recommended by makers for use with gas engines of large capacity, as the hot water from the engine cylinders can be used for the purpose of heating the oil. It is also recommended for use in gas or steam turbines, for the reason that an exceptionally large quantity of oil is used on these machines, and the oil being very thin will flow rapidly through this type of filter, owing to the effect of the hot water chamber at the top.

This type of filter has been installed by a large number of prominent manufacturers in the United States. It has been largely adopted for use in the United Staves navy, and also the Japanese and navies.

ADVANCING PRICES

Indicate Increasing Prosperity in England—Position of German Steel.

(Special Correspondence.)

BIRMINGHAM, Eng., Aug. 29.—Further signs are manifest of the recovery of the iron trade which though slow, seems to be sure. The makers of gas strip at their meeting on 'Change on Thursday last decided to put up prices for gas strip half a crown, making the figure £6 for small lots, with £5 17s 6d for orders of fifty tons and upwards. This means not only better demand, but a successful resistance for the time being of the one underselling firm which has so far managed to upset otherwise excellent plans for the advancement of prices. Spelter is 10s deared, further strengthening the position of galvanized sheets. Further news of advance come from Glasgow, steelmakers having decided of prices. Spelter is 10s dearer, further first advance in this branch since April, 1903. Some of the Scotch ironmasters have also raised the price of special iron brands 1s 6d per ton. Pig iron is decidedly hardening in price. German steel is in a curious position, inasmuch as though prices are approximating more nearly to English figures, the German houses rather discourage than invite business, in view of their probable home demands.

A very fair indication of the state of the rolling stock industry is afforded by the meeting of the Midland Railway Carriage & Wagon Co. this week. The firm, one of the largest in Birmingham, has made a profit of £30,122, paying a dividend of 7½ percent on the ordinary shares, with a bonus of 10s a share, and 6 percent on the preference shares. Yet the chairman, H. F. James, assured the meeting that this was one of the worst years he had known, the few orders given out having been subject to fearful competition. The debenture debt ten years ago, £180,000, had been reduced during the year from £40,500 to £27,000. The reserve fund is £92,000. Interesting personal changes have been made, Mr. Jackson having been transferred from the post of secretary to general manager. The chairman referred to the new manager as well-known and highly respected, and stated that he is to be succeeded as secretary by H. J. Rooke, a very old and trusted servant of the company. The shareholders were warned that heavy expenditure might be necessary to keep the concern quite up to date. Mr. J. S. Keep and Mr. W. A. Bridley were re-elected directors.

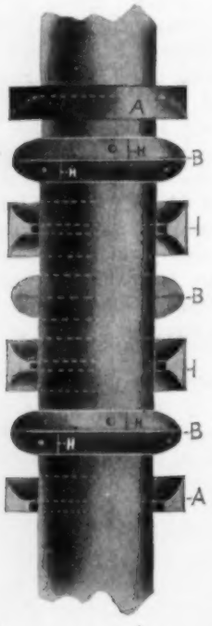
The late Enoch Baldwin, ironfounder of Mowbray House, Malvern, J. P., has left a fortune of £39,622, in the administration of which Alfred Baldwin, M. P., is one of the execu-

tors. The deceased gentleman was one of the founders of his firm, and for five years member of Parliament for Bewdley. Of late years, under the enlightened and progressive management of Alfred Baldwin, the concern, which has its headquarters at Stourport, has gone forward by leaps and bounds, and is now one of the first in the kingdom. Mr. Baldwin, M. P., the present chairman, does not conceal his decided support of Mr. Chamberlain's views on the subject of tariffs as a desideratum for the iron trade.

The fate of the Swan foundry, an old established concern mentioned in a recent letter, still trembles in the balance. The position is somewhat curious. The receiver, Walter N. Fisher, a well-known Birmingham accountant, with Mr. J. W. Barratt, another Birmingham accountant, as liquidator, is still in possession, and the works are not only doing a brisk business, but are carried on at a profit. This emphasizes the fact that the pipe-casting department, recently closed, has been the sieve through which the firm's money has been poured for years past. The earlier application of the closure would have saved the old works.

A NEW FORM OF METALLIC PACKING.

The Goodyear Tire & Rubber Co., Akron, O., has recently brought out a new form of metallic packing, which is illustrated herewith. This packing can be applied to any rod or valve stem without trouble or loss of time. The packing is made of two materials, metal and rubber. The actual packing is done by the metal pieces, the rubber acting merely as a cushion for the metal part, and does not touch the rod.



GOODYEAR METALLIC PACKING.

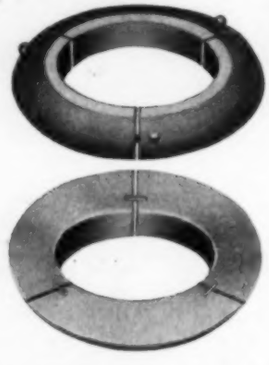
The metal portion is made in the form of a ring which is broken into three pieces. The cross section of this ring is roughly the quadrant of a circle. Two rings are placed together so as to break joints. The rubber ring is then placed between each pair of metal rings and the whole tightened up in the stuffing box.

In packing, a half ring of rubber "A" is first placed in the stuffing box. The metal ring "B" is next placed on the rod so that the beveled side will fit into the offset in the ring "A." To place the metal rings it is necessary that one of the small copper wires "C" joining the various portions of the ring be cut, which will permit of the ring being spread so that it can be easily placed around the rod. A second metal ring is placed on the first with the flat sides of the two together, care being taken to see that the joints are broken. A complete rubber ring "I" is then placed over the metal ring, and so on until the stuffing box is filled. A half rubber ring "A" is placed at the outer end of the stuffing box. The gland of the stuffing box is turned up by

RUBBER CUSHION-RING, GOODYEAR METALLIC PACKING.

hand so that it rests firmly against the packing. If there is any leakage when first starting the engine, the packing will soon adjust itself without tightening the stuffing box.

The maker states that it is a perfect packing for steam, air, ammonia, oil, water, and gases. It has been installed in a number of plants and has held under very severe conditions. For instance, at the Carnage Steel Works great



METAL PACKING RING, GOODYEAR METALLIC PACKING.

difficulty was experienced in packing a large steam hammer. The packing rarely lasted over nine days. Packing of this type was tried and ran sixty days without being renewed. The maker guarantees the packing to hold for one year, it having been tried in the shop for that length of time before being placed on the market for any given service.

Iron Production in the Donetz Basin.

The Engineer and Iron Trades gives the following summary of the production of iron in the Donetz Basin during 1904: Pig iron, 1,788,800 tons; billets, blooms, etc., 1,536,100 tons, and finished materials, steel, iron, etc., 1,292,700 tons. The production in 1903 was 1,341,590, 1,270,634, and 823,825 tons respectively. The stocks of pig iron at the various works at the end of the year amounted to 121,850 tons. The production of pig iron in 1905 is estimated at over 2,000,000 tons.

THE WAY THEY DO IT IN ENGLAND.

TROUBLES OF AN AMERICAN FOREMAN IN AN ENGLISH SHOP.

RELATED BY P. W. DILLON.

The Gobeille Pattern Co., of Cleveland, sent Mr. P. W. Dillon to England early in 1904. Mr. Dillon took with him a wooden pattern manufactured by the Gobeille company, from which metal patterns were to be made in England, and used in the manufacture of radiators. Mr. Dillon took this pattern to the works of Lumby, Son & Wood, Ltd., which are located in Greetland, near Halifax, Yorkshire. These works had recently been completed, and covered an area of about two and a half acres. Five hundred men were employed in the various departments, and included laborers, boiler-makers, machinists, pattern-makers and molders.

The concern manufactured welded boilers, hot water boilers for house heating and radiators. Welded boilers were used for furnishing steam at low pressure for steam launches, small steam engines and buildings, and various other purposes. They are made in sizes up to six feet in diameter, by simply welding a number of sheets together, rolling them to the requisite diameter, and then welding the joints. They are stated to give extremely good service in the class of work for which they are designed.

Mr. Dillon's work was principally in the introduction of American methods in the molding of the radiator coils. The firm gave him *carte blanche*, and he was entirely free to order any supplies or introduce any methods that he saw fit. The wooden pattern that he brought over from America was copied in metal, and then carefully placed away and the metal patterns used entirely in the foundry.

The Foundry.

The quality of sand used in the foundry did not begin to compare with that obtained in the United States. It was rather coarse and of a slightly reddish color, and always before using it was necessary to break it up and sometimes to grind it, in order to bring it to the requisite fineness for making a good mold.

Molding machines were almost unheard of in the district into which Mr. Dillon went. In fact, there was great opposition on the part of the journeymen molders to the introduction of any form of labor-saving machinery. They all went on the principle that there was a certain amount of work to be done, and that if a man cleaned up all the work in sight today, there would not be any work left for him to do tomorrow, and consequently he would be out of a job. The result was that the men "soldiered," and did not turn out more than a certain number of molds per day. In the United States Mr. Dillon found that the average molder would turn out in one day about 35 molds of the type he had taken to England. In the works in England he counted it a good day's work if he got 25 from a man. Shortly after starting work he decided that an ordinary laborer could be broken in and taught to do the work of molding radiator coils, as well as a journeyman molder could. He tried the experiment and made a success of it. A laborer who was getting 18 shillings per week for ordinary labor would be brought into the factory and instructed in the art of molding a radiator coil. He would be under instruction for about one week, merely being expected to turn out a certain quality of work each day. After spoiling a number of molds and being shown his faults in each case by the foreman, he would, in about a week's time, become fairly proficient. He would then be put on piece work and managed to make about £2 per week.

The sand was of such a nature that the mold had to remain in the flask until poured. An attempt to use snap flasks was made, but the objections of the workmen and the quality of the sand made the attempt futile. The workmen were not used to snap flasks, and absolutely refused to use them. When compelled to use them they took care that the proportion of failures to perfect molds was much greater with a snap flask than with the ordinary type. The flask used in the shop was made of cast iron and was about three times as heavy as would be thought necessary in the United States.

Mr. Dillon also tried the experiment of using laborers as molders on the sections for the hot water boiler for house heating. This was not a success, however, as there was more or less patching to be done on molds for these pieces and it was soon found that only a skilled journeyman possessed sufficient skill to do the work successfully.

Coremaking.

In making of cores some difficulty was experienced from the inability to obtain molasses for use in the mixture. In England the price of molasses is so high as to make its use in the foundry prohibitive. In place of molasses a preparation of linseed oil was used, which, however, did not give nearly as satisfactory results. The foundry flour was of a much better grade than that used in the United States. The cores were usually made by boys, who managed to turn out very good work. The core oven was of a brick structure and heated by means of a coal fire. The flues were so arranged that the hot gases from the fire had to go around all sides of the oven before reaching the chimney. The cores baked thoroughly and very evenly. The doors of the core oven were made of asbestos about one half inch thick, mounted in an iron frame. They were well balanced and were raised and lowered with but very little exertion.

The Cupola.

The iron used in the foundry was melted in a cupola of about 25 tons' capacity. The air used to blow the cupola was furnished by means of a pressure blower, which was driven from a line shaft. The air before being blown into the cupola was heated in a box situated just below the charging door. The cupola lining was stopped some six feet below the charging door, and on the inner edge of the lining were placed sheets, on edge, and joined to the cupola at the top, thus making a box which was directly exposed to the hot gases from the fire. The air from the blower was passed through this box and thence into the tuyeres. Compressed air, into which oil had been injected, was also blown in at the tuyeres. It was estimated that a saving of about 15 percent in the coke used was obtained by preheating the air and injecting oil into the fire. The ratio of iron to coke in the cupola was about ten to one. Both pig and scrap iron was used in the charges. The scrap contained a rather high percentage of silicon, in order to obtain sharp casitngs. The cupola was situated at one end of the room, and the men carried the molten iron in long-handled ladles which contained enough iron to pour about two molds. The foundry contained no trolleys for carrying the metal to the various molds, nor were there any overhead cranes installed. This necessarily made the work of pouring slow, but the carrying of metal in ladles was a method that the men had always been used to, and which they preferred.

The Workmen.

The personality of the workmen was a matter which occa-

sioned considerable trouble. They were very set in their ideas, as to the amount of work that should be done, and the privileges which they should be accorded. They had a fixed objection to piece work, though the laborers who were broken in as molders were able to make higher wages by this system than they would under a day rate. The premium plan was tried with the journeymen molders, who were engaged in molding sections for the hot water boiler. They were to receive eight shillings per day, irrespective of the quantity of work they turned out. For every mold over twenty that they made they were to receive twopence, but they never earned over eight shillings. The men absolutly refused to make more than the twenty molds per day. On trying the premium plan with the laborers who were making radiator coils it was found that in their anxiety to obtain a large amount of premium money a great many molds were spoiled, thereby greatly decreasing the efficiency of the shop. The plan was abandoned, therefore, and the laborers kept on straight piecework and the journeymen molders on day work.

The great fault of all classes of workmen in England is their habit of excessive drinking. At the entrance of nearly all works, there are to be found from three to a dozen public houses, where the workmen can go for lunch. A lunch is served for the men usually consisting of very thick sandwiches made up of either meat or fish, for which they pay about twopence. With this sandwich the workmen drink large quantities of beer or ale. All works in England are required by law to shut down at noon on Saturday; consequently, on Saturday afternoons a large number of the men would start drinking and continue this until Monday morning. As a result, they were very often unable to do proper work, or would not show up at all on Monday.

The tin dinner pail is unknown in England, the workmen bringing their lunch in a large red handkerchief. They do not carry cold coffee, as do the great majority of workmen in the United States. Aside from beer and ale, the chief beverage of the English workman is tea. All factories and shops in England are required by law to provide a dining room for their employes. In this dining room the workmen obtain their tea, or procure it at the public house.

The men are also much addicted to smoking. They smoke at all hours both in the shop and out. In fact, they consider it an infraction of their privileges if they are required to abstain from smoking during working hours. It would be thought that there would be great danger of fire in the shops from this cause, but the buildings are usually so well constructed that fires are of rare occurrence. The fire protection system installed in the works is usually so complete that when a fire does occur it is extinguished with but small loss.

The Wages.

The wages of all workmen are low compared with those received by men doing corresponding work in this country. The laborers receive about 18 shillings per week. The molders and other journeymen receive about 48 shillings per week. The working man rents a small house and pays about four shillings for it per week. They spend a great deal, however, for food and clothing; shoes particularly, are costly, most of them being brought in from the United States.

The amount of food consumed by the average English workman is enormous, there being about five meals per day. The men start work at 6:30; before going to work they have a cup of coffee and some bread. At 8:30 they knock off for an hour and have breakfast; then they work until noon when they have an hour for lunch. The shop closes down at 5:30, and the workmen have tea. Before going to bed, or about 9 o'clock, supper is served. The staple article of food is either fish or boiled tripe. Of the latter the average workman's family consumes a large amount during the week.

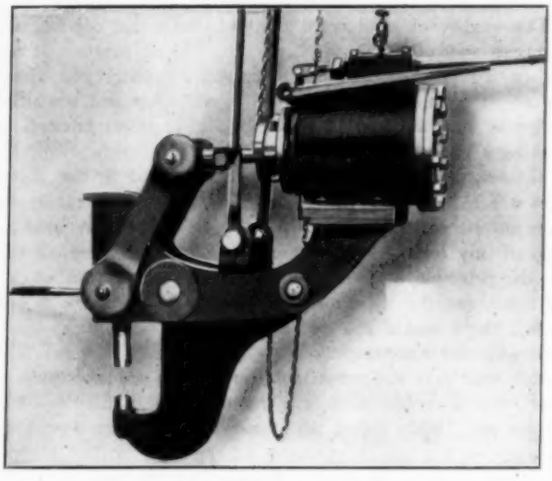
The foremen as a rule are well paid, receiving usually £5 per week. Their duties consist merely of instructing the men and seeing that they are provided with plenty of work. They are not required to do any clerical work whatever. A large office force is provided in all the better classes of shops, including timekeepers, cost keepers, and sundry others.

As a rule such a thing as bringing a man in from the outside to take the place of one who has left, in the executive department, is unheard of. A boy will be started in in the lowest position in the office and gradually advanced. When a person in a high position leaves the same, the next person below him is advanced and the entire office force is moved up to fill the vacancy left. The boy last hired assumes the duties of the boy immediately preceding him, and a new boy is hired to fill the lowest position.

THE JOHN F. ALLEN INTERCHANGEABLE STAKE LATTICE RIVETER.

A riveter, the frame of which may be altered to suit different conditions of work, possesses obvious advantages. Especially is this true of a lattice riveter which must do its work in places difficult to reach. The frame must be of such shape that the portion which opposes the thrust of the machine can be introduced into the interstices between the bars or angles, making up the lattice. The new interchangeable stake lattice riveter, manufactured by John F. Allen, 370-372 Gerard avenue, New York, is designed to meet these conditions.

The machine here shown, weighing 1,200 lb. and fitted for



INTERCHANGEABLE STAKE RIVETER.

1¼ in. rivets, is the size now regularly supplied, although designs for a smaller machine are in course of preparation. The cylinder is 12 in., the reach 6 in. and the gap 12 in. It is operated with a pressure of from 70 to 100 lb. to the square inch. The cylinder and the working parts have all the latest improvements found in Allen riveters of other designs.

The special feature of this riveter is the interchangeable stake, the lower portion of the frame attached to the main body by means of two pins. The dimensions of this stake determine the gap and the reach of the machine, and by substituting another of a different design the riveter may be made to accommodate widely varying conditions of work.

A NEW FORM OF STEEL RAILWAY TIE.

Jos. M. Griswold, of Detroit, Mich., is the inventor of the street railway and steam railroad tie which is shown in the accompanying illustrations.

The design of this tie is based on the theory that it must rest upon and enclose the ballast, so that the ballast shall become a continous and integral part of the superstructure. The projections that engage the flanges of the rails hold the rails firmly and also brace against the webs and treads of the rails, holding them in their upright position, and in perfect gauge and alignment.

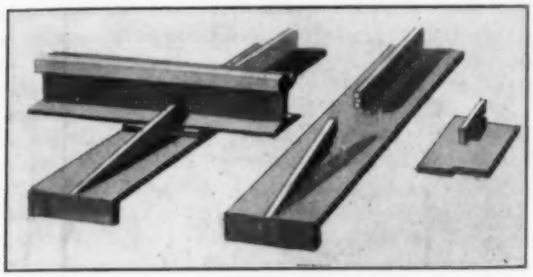


FIG. 1.—GRISWOLD STEEL TIES ARRANGED FOR STREET RAILWAYS.

The ties consist essentially of steel plates with projections some 6 in. deep at the ends, at right angles with the body of the tie. Underneath the tie are two lugs with projections which come approximately underneath the rail. On the upper surface of the tie, and along its longitudinal axis, a web is extended at right angles to the face of the tie. This web is beveled so as to meet the surface of the tie at its extreme ends. It is cut away at the proper point to permit passage of the rail. The cut on the outer side is so shaped as to fit the rail flange and web. On the inner side of the rail, a locking plate is placed. This locking plate is shown in the illustration as detached from the tie. It consists of a small plate carrying a projection which is cut away to fit the rail, web and flange, and also to engage with the web of the tie. When driven home it holds the rail firmly in

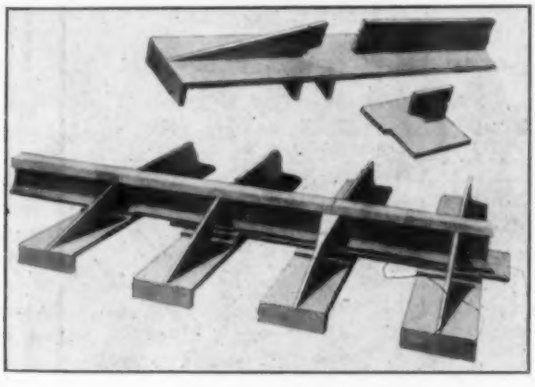


FIG. 2.—GRISWOLD STEEL TIES ARRANGED FOR STEAM ROADS.

place, binding it to the tie and also prevents lateral movement, thus holding the rails in perfect gauge. The locking plate is prevented from moving out of place by means of a bolt, and extends under the rail which thus holds it down and renders the rail, tie and locking plate as completely as possible one structure.

For rail joints a special form of tie is used. The general features are the same as in the ordinary tie, except that the outside of the vertical web which bears against the rail is made of sufficient width to engage the ends of both rails. A steel plate from ¾ to 1 in. thick, and long enough to extend over three or more ties is also placed under the joints.

Fig. 1 shows the tie as applied to street railways, and Fig. 2 as applied to steam road ties. The advantages claimed for this type of steel tie are:

First—That it takes a good hold upon the rails, binding them firmly together and holding the rails from spreading or canting. It also holds the track in perfect gauge, and the ties from creeping or springing.

Second—That it is adjustable as to weight, width of base, and strength of parts, and can be made to suit any requirements of different tracks, on both steam roads and electric railways.

Third—The projections engaging the flanges and webs of the rails hold them in position with greater strength than spikes in wood can approach.

Fourth—The locks are held in place by the slots engaging each side, by the weight of the rails, by side flanges on one end, and by bolts conjointly engaging the walls of slots and locks.

Fifth.—The underside webs at the ends will enclose the ballast to any depth, ensuring a firm foundation for the tie.

BRITISH NEWS NOTES.

Charles Richards, of Wednesbury, Staffordshire, founder of the business of Charles Richards & Sons, bolt and nut manufacturers, died recently in his 68th year.

Robert Kerr, Sr., forgemaster of Irvine, died July 20. In 1872 he started the firm known as the Irvine Forge Co., and later in company with his four sons, commenced business under the name of the Caledonian Forge Co. Mr. Kerr was born in Kilmarnock, Ayrshire, Scotland.

David Walton, for twenty years traveler for John Chorley, iron and steel merchant, of Warrington, Lanc., died recently at the age of 49.

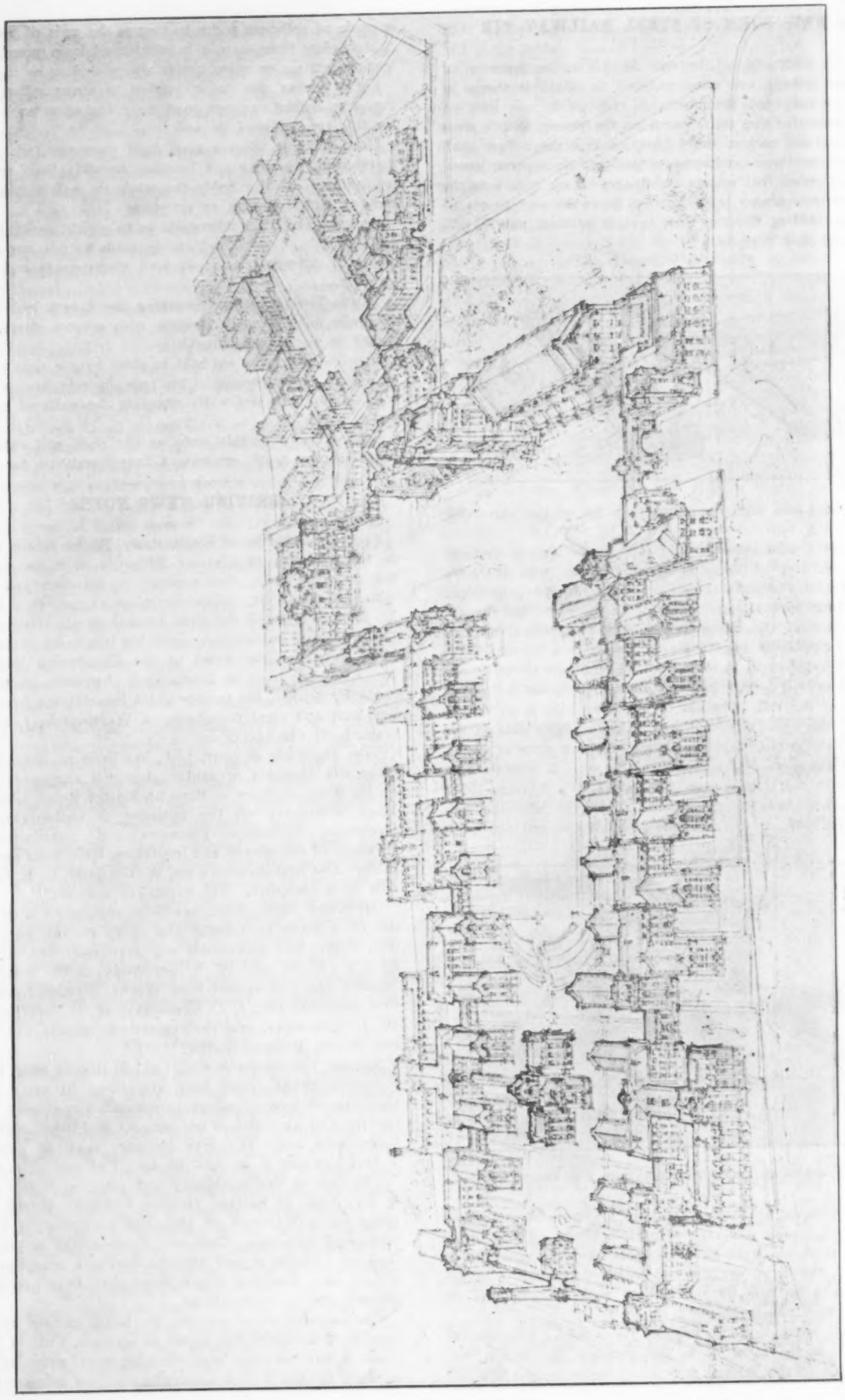
Wm. Gardiner & Sons, Ltd., has been registered to acquire the business of millwrights and engineers carried on by Wm. Gardiner & Sons at Bristol Road, Gloucester. They will carry on the business of millwrights, millfurnishers, mechanical engineers and manufacturers of all kinds of machinery and implements for flour and other mills. The first directors are W. Gardiner, C. E. Gardiner and A. J. Gardiner. The capital is £20,000.

Greenway Bros., Ltd., has been registered with a capital of £50,000 to acquire and carry on the business of iron rollers and galvanized iron manufacturers carried on by J. L., H. H. and W. K. Greenway, at the Britain Galvanized and Corrugated Iron Works, Bilston, Staffs. The first directors are: J. L. Greenway, H. H. Greenway and W. K. Greenway, and the registered office is the Britannia Works, Bilston, Staffs.

Samuel Thompson & Co., Ltd., Millfields near Wolverhampton, Staffs., have been registered to carry on the business of iron founders, mechanical engineers, manufacturers of agricultural implements and other machinery, toolmakers, etc. The first directors are: S. Thompson, J. McEwen and G. B. A. Gibbons. The capital is £25,000.

The sale of the machinery and plant of Victor Coates & Co., Ltd., of Belfast, Ireland, has been closed, everything being disposed of with the exception of the patterns and drawings. Between £12,000 and £15,000 were realized. About a year ago the business went into liquidation, as a result of which more than 1,000 people were thrown out of employment.

Considerable developments are being carried on in the steel department at the works of Kynoch, Ltd., at Witton, York, where not only large shell for naval guns, but heavy anchors for the British admiralty are now being produced.



PROPOSED ARRANGEMENT OF CARNEGIE TECHNICAL SCHOOLS.

Carnegie Technical Schools at Pittsburg, Pa.

The recent issue of a special catalogue announcing the completion, opening and curriculum of the School of Applied Science of the Carnegie Technical Schools brings very pointedly before the public this magnificent institution. Ever since the first publication of Andrew Carnegie's offer to erect and equip buildings and to furnish an endowment for this school, a more or less widespread interest in the project has prevailed. Now when one of the departments is being opened up and young men and women from all parts of the country are studying the advantages offered by this unique institution, an especial interest has been aroused warranting a somewhat detailed account of this great educational undertaking, which will stand in this century as a monument to the public enterprise and philanthrophy of its promoter.

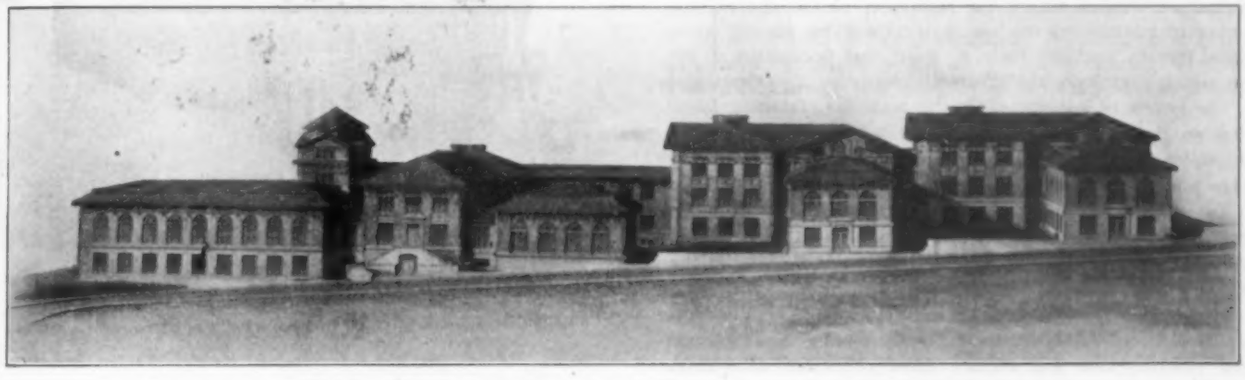
As has been completely outlined in an elaborately designed catalogue, the Carnegie Technical Schools will be established for the technical instruction of men and women in industrial pursuits. A site of 32 acres adjoining Schenley Park in Pittsburg, has been provided for the use of the schools and the erection of its buildings. In accordance with the plans outlined by Mr. Carnegie, the trustees of the Carnegie Institute, of Pittsburg, were empowered to carry the project into effect. A committee consisting of William McConway, chairman, John A. Brashear, W. Lucien Scaife, William N. Frew, James J. Booth, John G. Holmes, Charles L. Taylor and John F. Steel was appointed, and Arthur A. Hamerschlag was chosen director of schools. A competition was devised and opened to architects for the submission of plans which were required to comply with some certain restrictions but allowed for original designs by the various architects. The reward to the architect submitting the acceptable design will be the awarding of the contract for the erection of the buildings, one of which has already been completed. The group plan is shown accompanying this description and the buildings therein may be broadly classified in departments as follows:

I. Administration.
II. School of Applied Science.
III. School for Apprentices and Journeymen.
IV. Technical School for Women.
V. School of Applied Design.
VI. Service.

Outlining the features which the design must especially afford, the committee has looked forward to obtaining the most efficient arrangement of the buildings in regard to administration, lighting and the carrying on of study and shop work. A glance through these specifications as given in the catalogue, makes apparent the keen study which the supervising committee has given to the construction of the schools, and the immense resources at their disposal give every assurance that the buildings will be durably built and will provide for the necessities of a far distant future.

The "Administration" group will consist of five divisions including a general office building, faculty and reception building, auditorium and lecture building, a building for club rooms, a separate vault and a gymnasium. A total floor space of 110,300 ft. will be provided in this group and it will include about 40 distinct rooms. In connection with this section the directors' residence will be suitably placed and will contain about 15 rooms, so arranged as to provide for official entertainment.

"The School of Applied Science" group, for scientific and technical courses, consists of eleven separate buildings, providing for general superintendence, general instruction and service, machine design and construction, structural steel design, industrial, metallurgical and electro-chemistry, mining practice, railroad practice, applied electricity, steel manufacture, clay and ceramics and the manufacture of glass and foundry practice. A total area of 181,600 sq. ft. will be devoted to the necessary rooms of this department, which will be as complete as foresight and unlimited means can make them.



SCHOOL OF APPLIED SCIENCE OF THE CARNEGIE TECHNICAL SCHOOLS, PITTSBURG.

The third group is a "School for Apprentices and Journeymen," and offers the various trade courses. It embraces separate divisions for general superintendence and general instruction, carpentry, cabinet and woodworking, patternmaking, electrotyping and stereotyping, electrical work, house, fresco and sign painting, use of structural steel and iron, steam and hot water heating, sheet metal and cornice work, blacksmithing and machine forging, plumbing, masonry, bricklaying and plastering, printing, mining machinery, stationary steam engineering, foundry and molders' work and machinists' work. The total floor area for group III. will be 145,700 sq. ft.

Group IV. will be devoted to a technical school for women, and embraces a complete variety of courses which cover every possible employment in which women may find themselves. Nearly 100,000 sq. ft. of floor area is devoted to this group of buildings.

The fifth group is a "School of Applied Design," intended

for the application of design to industries and furnishes courses in interior decoration and design, ceramic art, the elements of architecture, stained glass and stone carving, repousse work, glass blowing, typographical art, art needlework and furniture design.

Group VI. will be the "heat, light and power plant" of the institution, and will include a power house, fuel storage and building for general purposes. The magnitude and immensity of this great school is in keeping with immense industry to which it owes its existence, and an enrollment of 4,000 students, for which the plans provided does not seem to exceed the demands for instruction which they will be called upon to meet. The catalogue, which was first approved in the spring of 1904, is at the disposal of those who inquire and may be obtained by addressing the director, Mr. Arthur A. Hamerschlag, Carnegie Technical Schools, 313 Sixth avenue, Pittsburg, Pa.

The School of Applied Science, which will be opened on Oct. 16, of this year, will have two distinct divisions consisting of courses for day students and courses for night students. An excerpt from the announcement gives something of the purpose and objects of this school.

The School of Applied Science provides courses of instruction in those studies which are essential to a technical education.

The elements in the curriculum are mathematics, physics, chemistry, drawing and shop work.

The general training given in these studies during the first year is intended to prepare students for more advanced and specialized studies during the remainder of the course, and serves in addition to disclose their fitness for specific vocations, thereby enabling them to select that occupation in life for which they have the greatest capacity.

The system of instruction aims to train the reasoning faculties; to develop the power of practically applying scientific principles, and of utilizing, in the industrial fields, the knowledge acquired in the school.

Energy, initiative, and individual capacity are recognized as of paramount importance, and emphasis will be laid upon the necessity of forming habits, character and associations, which will make these traits of permanent productive value.

The day school courses will equip students in architectural, civil, electrical, railway motive power, foundry and mechanical practice, and will require three years for completion. The entrance requirements are stated in the catalogue and are similar in purport to those of contemporary technical schools. The tuition fees are in keeping with the magnanimous purpose of the founder and are for residents of the city of Pittsburg $20.00 per year, and for all other students $30.00 per year. Entrance examinations will be held during the week Oct. 9-14, 1905, at the Technical School Buildings, Pittsburg. The term will end June 5, 1906. The night courses in the School of Applied Science will begin Nov. 14, 1905, and end May 15, 1906, sessions being held three evenings a week from 7:30 to 9:30 p. m. A further announcement of the curriculum and other details of the night schools will be published before Oct. 1, next.

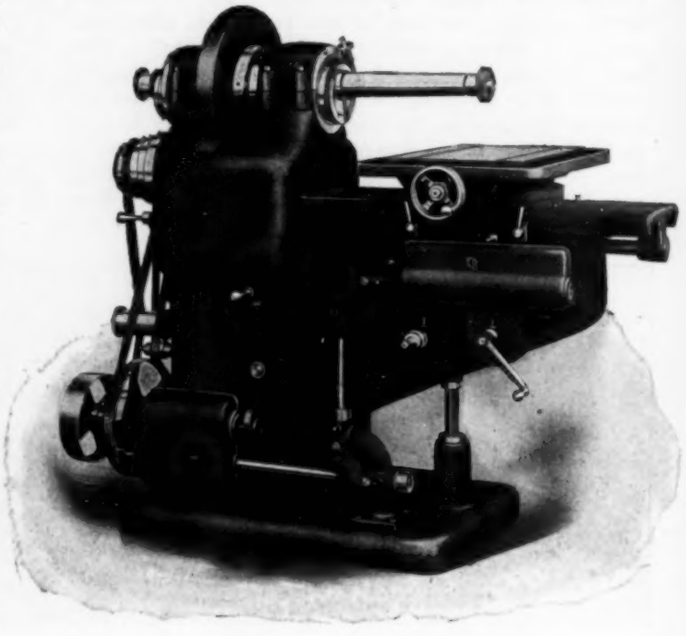
The birth of this school adds to the educational institutions of this country, complete and excellent as they are, and ranking high as they do among the colleges and universities of the world, a feature of educational work long established in the old world, which we have not hertofore included in the opportunities offered to the employed for obtaining higher education, and Andrew Carnegie has placed within the reach of tnat class a boon to be counted invaluable.

It is certainly to be hoped that this school will seem to solve many of the difficult questions as to where our workers in the many new industries are to be obtained.

THE HEALD CYLINDER GRINDER

The Heald Machine Co., Worcester, Mass., has recently brought out an entirely new tool, and which appears to differ from anything at present built. This machine has been developed for the accurate finishing of gas and gasoline engine cylinders, and for the internal grinding of parts, which are of such shape that it is impracticable to rotate them. It is intended to meet the demand for a better method of finishing them than that heretofore employed.

In the construction of automobile engines, especially, the walls are necessarily thin and when the surface is finished by boring or reaming, there is a continual tendency on the part of the iron to spring away from the cutting tool. If there are hard and soft spots in the iron it is extremely difficult to make a perfectly round hole with ordinary boring tools. These difficulties are obviated, however, by grinding, as there is no such pressure against the walls of the cylinders with the grinding wheel as there is with a boring tool.



HEALD CYLINDER GRINDER.

The character of the surface is also more perfect than can be obtained by boring or reaming.

The machine as shown in the accompanying illustration consists of a frame or column carrying a grinding spindle, which revolves about a horizontal axis. The grinding spindle is mounted in double eccentrics, thus giving a sort of planetary motion to the spindle and grinding wheel. This makes an effective device for getting the correct diameter of the holes and insuring their being perfectly round. Five different speeds of rotation are given to the eccentrics to handle work of different diameters and conditions.

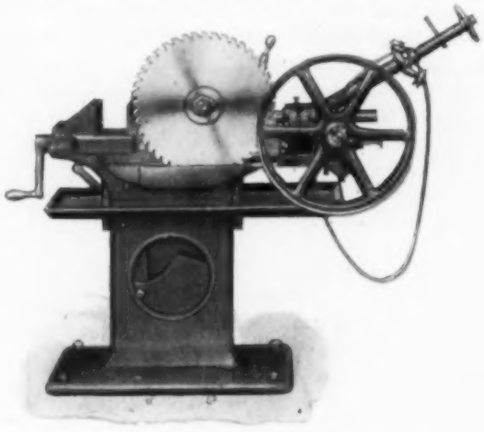
The wheel spindle runs in bronze boxes, which are provided with a simple adjustment for wear. The end of the wheel spindle is made tapering to receive wheels mounted on collets, thus allowing wheels to be changed without delay in truing up. Provision is also made for feeding out the wheel to regulate the depth of the cut, while the machine is in motion. On the front of the column is a knee, which carries the main sliding table, which travels back and forth in a line parallel to the grinding spindle. On the top of this table is a cross slide table for giving lateral adjustment.

In the operation of this machine the work does not rotate but is held in position by means of jigs or other fixtures

on the table of the machine, which is a convenient method of handling work which is large, or so out of balance that it is not easy to rotate it. This method of handling also makes it possible to grind duplex cylinders as readily as single cylinders. By means of vertical adjustment of the knee on the column and the crosswise movement of the upper table, any adjustment of the work can be obtained, either to bring a single hole in line with the grinding spindle or to transfer the work from one hole to another, as is necessary when duplex cylinders are to be ground. The travel of the table is automatic, reversing accurately at any point desired. The rate of traverse is controlled by a change-gear box on the column of the machine giving three different rates of feed to the table. This machine will finish holes up to 8 in. in diameter by 15 in. long.

HILL AUTOMATIC COLD-SAW CUTTING-OFF MACHINE.

The Hill-Standard Mfg. Co., Anderson, Ind., builds the automatic cold-saw cutting-off machine which is shown in the accompanying illustration. This machine possesses a number of unusual features. When work is being put into and



HILL AUTOMATIC COLD-SAW CUTTING-OFF MACHINE.

removed from the vise, the saw blade is not revolving, hence, there is no danger of workmen or material being caught. On advancing the saw toward the stock a clutch controlling the saw is thrown in, and the latter starts the saw revolving. The position of saw mandrel is so related to the vise that when stock is almost cut off and begins to weaken the saw-cut is opened by gravity instead of pinching the work. When the work is cut off the feed is automatically released and the saw returns to the position of starting and the revolution of same is stopped.

With this machine an automatic saw-sharpening arrangement is furnished which sharpens the saw while in its position on the machine. To sharpen the saw it is only necessary to advance the carriage to a point at which a dowel-pin will enter. This sets the machine in the correct position to sharpen the saw. A small emery-wheel is then placed in position and the temper screw adjusted the amount thought necessary to sharpen saw. The machine is then started and allowed to run; it will grind eccentric clearance to each tooth and stop when each tooth is equidistant from the center. This gives each tooth its proportion of the cut and makes a continuous, steady pull and a very rapid cutting saw. The blade remains perfectly true on the machine.

The saw itself is 14 in. in diameter, and 5-32 in. thick. The capacity of the machine is work up to 3 x 4 in.

A NEW AUTOMATIC CLUTCH.

The Automatic Clutch Co., of Akron, O., has recently placed on the market a new automatic clutch, which is shown in the accompanying illustrations. The company has aimed to produce a clutch which fulfills the following requirements: The operator should have perfect control of the clutch,

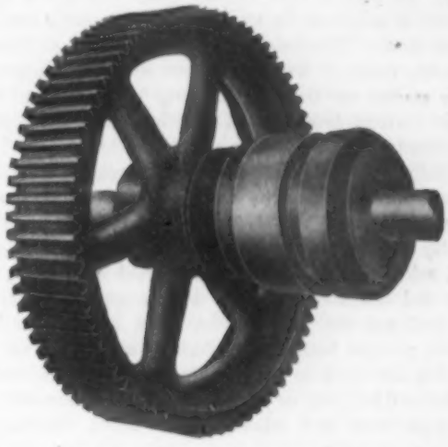


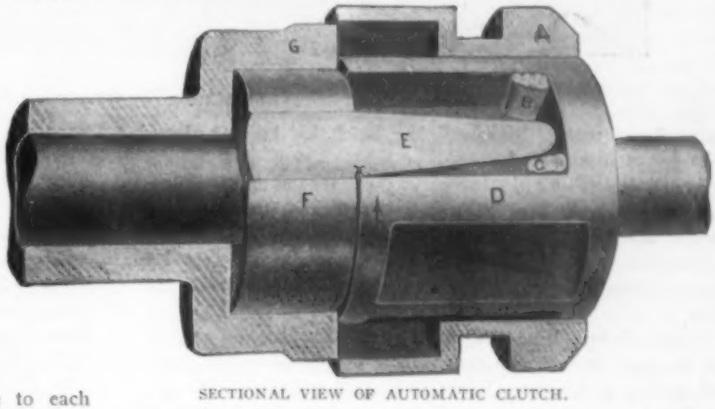
FIG. 1.—AUTOMATIC CLUTCH AS APPLIED TO GEAR WHEEL.

being able to accelerate a load from rest to full speed, uniformly, and also to be able to disengage it with ease. When totally engaged a clutch should not slip; it should cause a positive union between its two members. It should be able to slip when a given load is exceeded. It should not require adjustment or attention outside of oiling, during its life. It should be simple and compact in construction, round and smooth with no projecting parts.

In Fig. 1 is shown a sectional view of the clutch in the disengaged or off position. The pins B and C are carried by the sleeve A. These pins fit between the faces of the cavity in the keyed member D. A lever E is placed loosely between the pins B and C. This lever extends between the ends of the expansion ring F, and is surrounded by the cup or loose member G.

If the keyed member D be rotating in the direction indicated by the arrow, the ring is freely revolved by the lever E, which is driven at the point x, as pin C is free of the lever; and pin B operates on the lever only when the member D is revolving in the opposite direction.

When the clutch is engaged, the sleeve A is moved to the



SECTIONAL VIEW OF AUTOMATIC CLUTCH.

left, and pin C gradually relieves the bearing point x on the lever, and the member D drives the ring by the lever through the pin C. This causes the lever F to be expanded within the cup G, with such pressure that the friction caused exceeds the force on the lever. Hence, "the greater the load the tighter the grip."

Installation of Machinery in the Steamer "Powell Stackhouse."

The installation of machinery into the steamer Powell Stackhouse at the yard of the Detroit Shipbuilding Co. marks a record for despatch which has never hitherto been attained on the great lakes. The Stackhouse was launched at Wyandotte at 11 a. m., Aug. 5. Tow lines were already attached to her and she started for the machine shop at the foot of Orleans street in Detroit immediately, arriving there at 2:30 p. m. Three hours later, or at 5:30 p. m., the boilers were landed in the ship. The daily chronology of progress thereafter is extremely interesting. No work, of course, was done on Sunday.

Monday—Hoisted in first, upper breeching, Ellis & Eaves fan; second, ash elevator legs, air pumps and condenser; driving bearing and intermediate shaft, main engine; set engine and boilers and got the template for main steam pipe Monday afternoon and put boiler house deck on and bolted up.

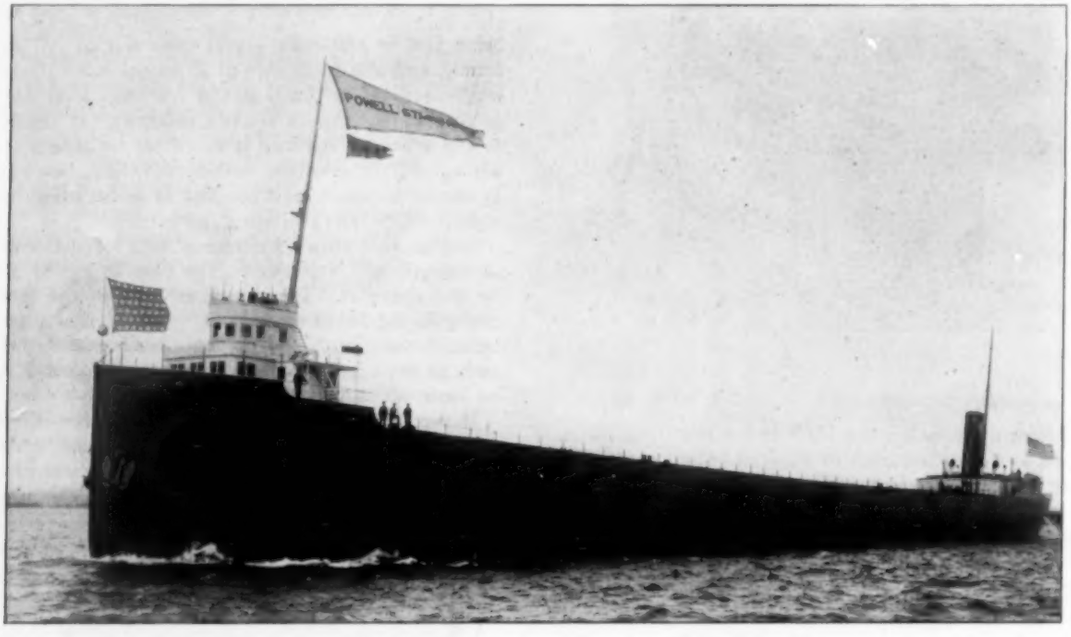
Tuesday—Hoisted in steel spars, stack, pistons and cylinders; finished hoisting in of the machinery, connected up main steam pipe, main and auxiliary feed pipes, auxiliary steam and exhaust pipes; drilled all the holes for holding down bolts for main engine.

Wednesday—Filled the boilers in the forenoon and had preliminary test. At 3 p. m. the United States inspectors inspected the boilers.

Thursday—Finished riveting up the boiler house, started a fire and raised steam. Finished bolting down the main engine.

Friday—Screwed up the joints around boiler and engine, put on caps, etc.; started main engine at 1 p. m. under steam and worked it for three hours at a good stiff gait until satisfied it was ready for sea. Forty-eight working hours only were consumed in installing the boilers and engines and having machinery running smoothly under steam. As soon as the engine was stopped Friday it was cleaned thoroughly, ready for painting.

The fact that the company succeeded in putting the boilers in on the day of the launch made it possible to work the engine on Friday or a day ahead of the time in which it was planned to work her. The work was all prearranged and nothing but an unforseen accident could have prevented the company from doing it in the time planned. Absolutely nothing was left to chance. Everything was in readiness, the machinery being on dock in the relative position that it would occupy on board ship and the workmen moved with clock-like regularity not to miss a single moment. Supt. C. B. Calder, under whose supervision the work was done, says that the performance is to be credited purely to the organization of the personnel. Many of the heads of departments of this company have been continuously there for a quarter of a century or more and are skilled and rapid workmen. Supt. Calder gives especial credit to W. G. Henderson, foreman of the machine shop, who has been in the company's employ for twenty years or more; to John Chambers, steam fitter and plumber; to Robert Gray, sheet metal worker; to Hugo Betzold, boiler maker; to Fred Ritchie, who installed the steering gear and hatch fasteners; to James Hunter, who erected the engine in the boat; to John Fitzgerald, an excellent workman, who hoisted the machinery into the boat, and Mr. William Robinson, who was sent up from Cleveland by the American Shipbuilding Co., to act as foreman on cabin work. Supt. Calder says, however, that there were others quite as deserving of special mention as these, and spoke with pride of the fact that even the humblest employee on the dock was imbued with the spirit of the occasion.



THE STEAMER "POWELL STACKHOUSE."

It was exactly 113 working hours from the time the Stackhouse was launched until she was furnished and ready for sea. The machinery was completely installed during the first week, the second week being spent in testing the water bottom tanks, in finishing up the joiner work, in painting and putting in furnishings.

This record of fourteen days is not likely to be excelled

by any other yard, as the Wyandotte yard has exceptionally good facilities for despatch. As a matter of record it may be noted that it was forty-one days after the W. A. Paine was launched before she went into commission; the Corey, 49 days; the Sylvania, 60 days; the Socapa, 44 days; the Amasa Stone, 43 days; the L. C. Smith, 21 days; the Phillip Minch, 57 days; the W. A. Rogers, 30 days; the L. C. Hanna, 51 days; as against 14 days for the Stackhouse.

The Stackhouse could have left Detroit on her maiden trip on Aug. 19, on which day she was turned over to her crew. She left, however, on Aug. 20, as her owner desired to make the initial trip on her and did not reach Detroit until Sunday. The steamer on her initial trip covered the distance between Port Huron and Sault Ste. Marie in 22 hours and 20 minutes, or at the rate of 12.4 knots an hour, the machinery working throughout with absolute precision.

The engines of the Stackhouse are of 2,000 h. p., the cylinder diameters being 23½, 38 and 63 in. x 42 in. stroke, supplied with steam from two boilers 14 ft. 6 in. diameter and 12 ft. long, allowed 180 lb. pressure and fitted with Ellis & Eaves induced draft. The propeller is 14 ft. 3 in. in diameter and 14 ft. 6 in. pitch; revolutions per minute, 85. The weight of the machinery is 325 tons.

To Boom American Products.

The American Floating Exposition, managed by the Export Shipping Co. with head offices at 11 Broadway, New York city, is an enterprise which will be deserving of the attention of many industries. Correspondence with the company has elicited the statement that an 8,000-ton steamer will be sent around the world on a trip to consume 15 months, in which a distance of 60,000 miles will be covered, the object being a display of American manufactured products, which will be advantageously exhibited on the boat at ports in every country. The three upper decks of the ship providing about 20,000 sq. ft. of floor space will be available for exhibition purposes. All possible arrangements for bringing the fact of this exposition before possible foreign buyers will be made, and plans will be carried out so that representatives may personally interest the trade in every port. The display will be in the hands of well informed representatives of each exhibiting company's products. The enterprise gives every evidence of being reliable and carefully planned, and is not designed as a money-making scheme. A prospectus has been issued in which the cost to exhibitors and the various items of expense are given in detail. Complete information as to the actual progress of the undertaking and just what is hoped to be accomplished may be obtained by addressing the managers. The idea seems to be an excellent one, and from an advertising standpoint a remarkably good investment for a variety of industries. The co-operation of the department of Commerce and Labor has been obtained, and if a sufficient number of manufacturers see fit to take advantage of this scheme its success would seem to be assured.

Lake Superior Mining Institue.—Volume 10 of the Proceedings of the Lake Superior Mining Institute has been issued by the secretary, A. J. Yungbluth, of Ishpeming, Mich. The book shows a membership of 460 men interested in Northwestern iron and copper mining, and in addition to the usual routine proceedings, gives the papers presented at the last annual meeting. There is also a brief description of the Gogebic range, where the meeting was held, and a resume of the mining methods in use on the Vermillion and Mesabi districts as described in the reports of United States geological survey, extracted by Kirby Thomas. In an appendix there is a good deal of early Lake Superior history.

MAKING AND REPAIRING OF LOCOMOTIVE FRAMES.*

BY S. UREN.

The conditions which confront us with the repairing of this important member, the locomotive frame, have so changed in the last ten years, that we have difficult problems to solve, and we must keep abreast of the changed conditions.

Ten years ago, the wrought iron frame, that has done its work so well for half a century, was universally in evidence. Failure of the old type iron frame was of a rare occurrence, and easily repaired in the blacksmith shop. What are the conditions today? We have the low carbon cast steel frame with all of its imperfections. Another innovation is the welding of broken frames on the engine with oil for fuel, instead of bringing to the blacksmith. Another method of repairing without removing the frame from the engine, is welding with "Aluminum Thermit."

Evidently the steel frame will be the frame for the future, for the reason that it can be produced much cheaper than wrought iron forged frames. Future developments may bring this metal to such a standard that it will resist the strain to which it is subjected as well as will the forged iron frame. From my point of view and the many failures that have come to my notice in the past two years, it has not yet reached the standard that the wrought iron frame has. Many of the steel frames break at the intersection of the pedestal to the back bone of the frame where the main driving axle is located. As this failure often takes place with our largest engine frames, it is evident that the severest strain is located at this point, consequently it cannot be expected that an ordinary weld at this point will be stronger than the original solid material. When a broken steel frame is placed in the blacksmith shop the best practical method to strengthen this portion of the frame should be adopted, regardless of extra expense. The method adopted in the Southern Pacific shops is to forge a new piece of the best quality of iron and cut out the defective portion; weld in a new T piece with the fiber flowing in the direction of the strain to which this portion is subjected. By this method, we have to make three welds. This may look like a round about way of repairing the fracture. The object of this is to get a sound piece of iron at the point where failures continually occur in the steel frames. The method adopted for welding the new piece into the steel frame is first to weld a piece of iron about an inch thick on to the different ends of the frame at the proper angle to receive the V-shaped piece, the new piece being firmly fastened in place with straps bolted together. By this method, we have for our main welds, iron to iron to receive the V-shaped pieces.

The welding of frames with oil without removing the same from the engine has caused me, as well as many of our other members, to become somewhat skeptical regarding this method. However, it is remarkable that all of the welds noted in the reports of welds which have been made by this method, there has been only one failure. Great claims are made by some of our California shops for this method of repairing frames. I know of several cases of frames, welded by this method that have not run ten miles before the welds parted. The engine returned to the shops, and the frames removed and properly welded in the blacksmith shop. Certainly a good welding heat can be produced by this method in members of frames that are accessible. However, I am opposed to butt welding or any other method of welding in the blacksmith shop, after the iron is brought to a welding heat, without the proper lamination.

Iron, when brought to a high heat becomes disintegrated.

*Abstract of a paper presented at the convention of the National Railway Master Blacksmiths' Association, Cleveland, Aug. 15-17, 1905.

The molecular structure is impaired and lamination is the only method that will produce the original structure. In my opinion the same conditions exist in welding frames on the engine where lamination is impracticable. If the metal has to be brought to a welding heat, the proper place to make the weld is on the anvil.

If a first-class weld can be made on a steel or iron frame by this method, the same method would be applicable to other members of the locomotive. I do not think there is a member of this convention who would attempt to weld a main rod or side rod of an engine by this method. If not, why?

Another innovation in the art of blacksmithing is the repairing of frames on the engine by the Thermit method. This above all other methods is the simplest and quickest and from my point of view is the best, forge, anvil and steam hammer excepted. At the present time the Thermit method is in its experimental stages; it does not require an experienced smith to repair a frame on the engine by this process. The most particular part of making the preparations for the weld is the making of the mold to fit perfectly around the part of the frame to be welded. This is usually done by a molder. The molds should be made in halves and bolted together, so that all joints are perfectly tight. By this method of repairing, we not only form a perfect union of the broken sections but we can also reinforce the weak points with a collar of any dimensions we may desire, projecting on each side of the fracture.

IRON AND STEEL PRODUCTS

Displayed at the Canadian National Exhibition—Bureau of Mines Report.

TORONTO, CAN., Sept. 4.—The Canadian National Exhibition was formally opened here Aug. 29 by Premier J. P. Whitney in the presence of an unusually large assemblage. Prince Louis, of Battenberg, an admiral of the British navy, accompanied by many of his staff, was the guest of the directors. There was an extensive display of machinery and iron and steel products, many of the machines being shown in operation. Electrical machinery was much in evidence, among the companies represented being the Canadian General Electric Co., of Toronto, which furnishes the power used for the mechanical processes shown; Toronto & Hamilton Electric Co., of Hamilton, Ont.; United Electric Co., Toronto; the Jones & Moore Electric Co., Toronto., and the Consolidated Electric Co., Toronto. The display of the latter includes some improvements in induction motors specially adapted to facilitate the transmission of the electric current from Niagara Falls to Toronto.

The Canada Foundry Co., Toronto, has a large display of engines, forgings, etc., including a fire pump with a capacity of 1,500 gallons and 70 revolutions per minute.

The Henderson Roller Bearing Co. and the Chapman Double Ball Bearing Co., both of Toronto, make extensive showings. The line shafting used in the building is equipped by the latter company.

Among the leading exhibitors of machinery are the Goold, Shapley & Muir Co., Brantford, Ont.; the Goldie & McCulloch Co., Galt, Ont.; the Borden Co., Warren, O.; the E. Long Mfg. Co., Orillia, Ont.; Canadian Bearings Co., Ltd., Hamilton, Ont.; the Georgian Bay Engineering Works, Midland, Ont.; the Defiance Iron Works Co., Chatham,; the A. R. Williams Machinery Co., Toronto Gas & Gasoline Engine Co., Canada Launch & Engine Works, Canadian Fairbanks Co., C. Wilson & Son, Dodge Mfg. Co., S. Vessot & Co., Babcock & Wilcox, Ltd., Pendrith Machinery Co., James Morrison Brass Mfg. Co., Walker Nicholls Motor Boat Co. and Johnston Oil Engine Co., all of Toronto.

Farm implements and machinery are shown by the J. I. Case Threshing Machine Co., the Ontario Wind Engine & Pump Co., American Seeding Machine Co., De Laval Separator Co., and the Farmers' Co-operative Harvesting Machine Co., all of Toronto; McKeough & Trotter, Chatham, Ont.; T. E. Bissell, Elvia, Ont.; the Paris Plow Co., Paris, Ont.; the Steel Trough & Machine Co., Tweed, Ont.; the Grimm Mfg. Co., Montreal; the Dominion Wrought Iron Wheel Co., Orillia, and the Lowden Machinery Co., Guelph, Ont.

The display of stoves and ranges was a large one, exhibits being made by the following firms: Archer Light, Heat & Power Co., Chas. F. Rees & Co., Canada Malleable & Steel Range Mfg. Co., Geo. Sparrow Wrought Iron Range Co., A. Welch & Son, Gurney Foundry Co. and Pease Foundry Co., all of Toronto; the D. Moore Co. and Burrow, Stewart & Milne, of Hamilton; Moffat Stove Co., Weston, Ont.; Doherty Mfg. Co., Sarnia, Ont.; Telephone City Stoves, Ltd., Bramford, Ont.; Guelph Foundry Co. and Grundy Stove Co., Guelph, Ont.; Western Foundry Co., Wingham, Ont.; Walker Steel Range Co., Grimsby, Ont.; and Clare Bros. & Co., Preston, Ont.

Wire fence manufacturers who displayed their goods on the grounds included the Page Wire Fence Co., the Canadian Portable Fence Co., the Canadian Steel & Wire Fence Co., all of Toronto; the Owen Sound Wire Fence Co., the Forest Wire Fence Co. and the Pittsburg Perfect Fence Co., both of Hamilton; the McGregor Borwell Fence Co., Walkerville, and H. R. Lamb Fence Co., of London, Ont.

The Ontario Bureau of Mines has issued a statement showing the output of the metalliferous mines and works of the province for the first six months of 1905, indicating a considerable increase in nearly every branch over any previous six months. The total value amounts to $6,529,728. The quantities and values of iron and steel produced were as follows: Iron ore, 113,583 tons, $274,224; pig iron, 116,794 tons, $1,510,197; steel, 64,527 tons, $2,070,003. Nearly all the iron ore came from the Helen mine, Michipicoten district, and a large portion of the steel was made at the Algoma Steel Works, Sault Ste. Marie. There were five blast furnaces in operation during the half year, two at Sault Ste. Marie and the others at Hamilton, Midland and Deseronto.

The Dominion Steel & Iron Co. is endeavoring to improve the quality of its coke, and with this object in view has placed an order for 2,000 tons of coal with the Cumberland Coal & Railway Co., of Springhill, N. S., which will be used as a test. On Aug. 28 the company made a shipment of 1,750 tons of Hill rail billets and wire rods, being the largest consignment shipped since it began manufacturing steel.

The Vermont Farm Machine Co., incorporated under the laws of Vermont, has been licensed to carry on business in Ontario on a capital of $25,000.

Japan Buying Railway Supplies.—Six representatives of the Imperial Railway system of Japan arrived in Chicago and left for New York via the Great Lakes. They are in this country to study the American locomotive and to purchase railway supplies. From New York they go to England, thence to France and Germany. One of the party, Toki Oyata, said: "Japan is preparing to spend over $30,000,000 in railway supplies, and the bulk of these will be secured in the United States and England. I think these two countries lead all others in this respect."

NEWS FROM MANY INDUSTRIES.

New Buyers :—

The Merryman Engine & Motor Co., New Haven, Pa., has been incorporated with $5,000.

The Wallaceburg Brass & Iron Mfg. Co., Ltd., has been registered in Toronto, Canada, with a capital of $40,000.

The Detroit Pneumatic Tool Co., of Detroit, Mich., has been incorporated with a capital of $65,000.

Economical Tool Co., Milwaukee, has been incorporated with a capital stock of $6,000. The incorporators are: Lorenz E. Seymer, Charles A. Ast and Charles W. Seymer.

Manual training schools at Lynn, Mass., and New London, Conn., are to be erected and to be equipped with machinery which is still to be purchased.

Charles W. Mayer, Rochester, N. Y., is in the market for tools to be used in the manufacture of punches, dies, special tools and machinery.

The Clark Heater Co., Canton, O., has been incorporated with a capital of $50,000. The incorporators are: P. J. Comer, C. T. Clark, Robert Farren and G. A. Karper.

The C. T. Williamson Co., which is planning to erect a wire novelty plant in Newark, N. J., will soon be in the market for new equipment.

The Columbus Chain Co., Columbus, O., has been incorporated with $400,000, by C. M. Wambaugh, S. A. Webb, I. B. Cameron, J. W. Jones and H. E. Stafford

The Day Stove Foundry Co., Bessemer, Ala., has been incorporated with $10,000 capital stock. The incorporators are: J. R. Day, Pinckney Scott and G. L. Scott.

The Great Northern Metal Co., Chicago, has been incorporated to deal in metal. The capital stock is $10,000, and the incorporators are: Ralph Lipsey, Joseph Pasimensky and A. Lipsey.

The Charter Mfg. Co., Chicago, Ill., has been incorporated with $50,000 capital stock, to manufacture machinery. The incorporators are Frederick F. Judd, Geo. F. Ramon, and M. B. Judd.

The Standard Machinery & Supply Co., Phoenix, Ariz., has been incorporated with a capital stock of $250,000. The incorporators are: W. A. Stevens, W. W. Wishon and E. E. Foster.

Oscar C. Eben, of Cleveland, has purchased the plant and property of the old Ideal Foundry Co., Ashtabula, O., and will proceed at once to equip and revive the industry.

The Schaeffer-Sharpneck Co., Chicago, has been incorporated with a capital of $2,500, for the purpose of manufacturing machinery. The incorporators are: Henry Schaeffer, W. S. Sharpneck and Frank A. Sharpneck.

The Zillox-Green Co., Buffalo, N. Y., has been incorporated with a capital of $6,000. The directors are: John Zillox, H. L. Green, Albert Zillox, Robert Stedler and Louis F. Schlager. The company will deal in machinery.

The Wallingford Metal Co., Hartford, Conn., has been incorporated with a capital stock of $25,000. The incorporators are: Abel Kenworthy, Frank P. Welton and Robert D. Somers.

The Budell Machine & Foundry Co. has been incorporated in New York with a capital of $10,000. The incorporators are: Frank Brookfield, 220 Broadway; John H. Thompson, Jr., 60 Wall street; and Henry M. Brookfield, Ardsley-on-Hudson, New York.

The Manhattan Iron Works has been incorporated in New York to manufacture structural and ornamental iron work. The capital is $25,000 and the incorporators are: Amand Busse, No. 302 East Ninety-eighth street; Henry H. Hull, and Manton Moore, Nassau street.

The Gould-Welden Co., Borough of Queens, New York, will operate machine shops, foundries, etc. The incorporators are: Frank A. C. and Almira S. Gould, No. 133 Twelfth street, and Samuel T. and Mary Welden, No. 60 Seventh street, all of Long Island City.

The Independent & Auxiliary Gas Co., Boston, has been incorporated to manufacture gas machines, etc. The capital stock is $75,000. The officers are: President, H. L. Baker, 30 Court street, Boston; treasurer, Tellis F. Kelley, Winchester, Mass., and clerk, Robert S. Lawrence, 24 Kingston street, Boston.

The United States Blow Pipe & Hydraulic Works, Seattle, Wash., is contemplating the erection of a new building 60 x 160 ft. in which a considerable amount of new machinery will be installed. The company is now in the market for this equipment, which includes shears, rolls, punches and a variety of plate handling machinery.

The Morgan Spring Co., Worcester, Mass., has changed its purpose of business and will manufacture and deal in machinery, iron and steel rods, wires, springs and other articles of merchandise composed wholly or in part of iron, steel or other metals. It was also voted to increase the capital stock of the company by the amount of $600,000.

The Alabama Fuel & Steel Co., Birmingham, Ala., has been organized with J. M. Overton, of Nashville, as president, and H. F. De Bardeleben, of Birmingham, as one of the principal directors and managers. The company has acquired extensive coal lands in St. Clair and Jefferson counties and is already actively engaged in building houses for the employees.

The Pennsylvania Railroad Co. is in the market for one 500-lb. helve hammer, one bolt heading, upsetting and forging machine; one 5-ton electric traveling crane, span 46 ft. 4 in. center to center of runway rails, with gauge in middle; one 6,000-lb. capacity electric traveling crane; one two-stage air compressor, with compound steam cylinders; one 18-in. by 6 ft. turret lathe, with the necessary hobs, leaders and followers.

The Sheet Metal Specialty Co., Goshen, Ind., has been incorporated with a capitalization of $2,000. R. F. Barron is president and Thomas H. Mew, secretary and treasurer. The company will do architectural sheet metal work, make cornices, skylights, store fronts, roofing and spouting, job metal ceilings and warm air furnaces. It will be located at 105-111 West Washington street.

The Worcester Steel Foundry Co. has been incorporated in Massachusetts with a capital of $300,000, to deal in products from iron, steel, etc. The directors are: President, J. C. Emanuel Trotz, 20 Green lane; treasurer, William H. Cook, 67 Union street, and clerk, Edgar Whidden, of the same address, all of Worcester, Mass.

The Bay State Machine Screw Co., Boston, has been incorporated with a capital of $100,000, to deal in machinery for the manufacture of screws, etc. The directors are: Fresident, Frank Foss, 3 Hancock street, Boston; treasurer, Fred A. Ewell, 1433 Washington street, Boston; and clerk, George M. Faulkner, 71 Chestnut street, Cambridge, Mass.

The Green Compressed Air Co., 27 Market street, Camden, N. J., has been incorporated with a capital of $300,000 to acquire letters patent for improvements in air compressors and compound air engines. The incorporators are: Thomas R. Green, Burke Stephens, Emil Macky, Charles O. Roberts and Henry A. Reier, all of 27 Market street, Camden. The new firm will take over the business

of Thomas R. Green & Co., 210 North Fourth Street, Camden, N. J.

The Michigan Wire Fence Co., Adrian, Mich., has been incorporated with $125,000 capital stock. Ground has been broken for the new building to be 50 x 155 ft., two stories high, of brick with cement foundation, at a cost of $12,000. The officers of the company have not yet been announced, but among the stockholders are the following: Charles G. Wesley, A. B. Park, B. E. Tobias, Ernest Tobias, S. S. Whitington, J. J. Morse, D. M. Baker, George A. Wilcox, Robert Thompson, A. W. Tobias, H. W. Porter, R. A. Woolsey and David Stott, of Detroit.

The Marshalltown Drop Forge Co., Marshallton, Iowa, was recently incorporated with a capital of $25,000. The company will manufacture steel tools, and is the only drop forge plant west of Chicago. A contract has been closed with the National Hatchet Co., of Webster City, Iowa, for the manufacture of the patent steel hatchet that firm will market. The company will also manufacture a part of the steel wrenches sold by the Hawkeye Wrench Co. The officers of the new company are: C. R. Speers, president and treasurer; E. E. Valentine, of Webster City, vice president, and G. A. Smith, of Laurel, secrtary. S. A. Smith, of Chicago, will have direct supervision of the factory.

Fires:—

A fire causing an estimated loss of nearly $500,000, broke out in the big Pennsylvania traffic building of the Cambria Steel Co., at Johnstown, Pa., last week. Insurance to the amount of $392,000 was carried.

The Aetna Foundry & Machinery Works, Springfield, Ill., was slightly damaged by fire, the origin of which is unknown.

The Montreal Engine Works, Montreal, Can., was damaged by fire to the extent of $3,000 recently. The plant was insured.

The Charles Holmes Machine Co., East Boston, Mass., was damaged to the extent of $35,000 as the result of a fire in the building which it occupied.

The new plant of the Atlanta Agricultural Works was burned recently and the loss resulting from damage to buildings and equipment will amount to $35,000. Insurance amounting to about $20,000 was carried. The company will be able to repair the damage sufficiently to fulfill all their orders.

Strickland Bros.' machine shops, Tuscaloosa, Ala., were totally destroyed by fire, Aug. 24, resulting in a loss of $60,000. The plant will be rebuilt as soon as possible. Some of the machinery, though badly damaged, may be repaired and again put in operation.

The Canada Machinery Co., Point Edward, Ont., was gutted by fire recently, entailing a loss of $125,000 to the plant and an additional loss of a large quantity of machinery which was in the factory unfinished.

A fire whose orgin is unknown but which was thought to have been started by incendiaries, was discovered in the three-story brick building occupied by the Weir & Craig Mfg. Co., in Chicago, a week ago. The fire was the more dangerous because of a quantity of grease and lubricating oil stored in the building. The damage resulting to the building and its contents amounted to about $50,000.

New Construction:—

The Ohio Foundry Co., Cleveland, is erecting a brick addition to its plant.

The Shenango Furnace Co., Pittsburg, has let the contract for a new $9,000 office building at Sharpsville, Pa.

The Union Twist Drill Co., of Athol, Mass., is receiving estimates for a one-story building, 60 x 180 ft.

Ground has been broken for the new building to be erected by the Rowbottom Machine Co. on Sheffield street, Waterville, Conn.

The Valley Iron Works Co., Appleton, Wis., has just completed its new building, which is 32 x 120 ft. The additional space will be needed at once.

The Davis Foundry & Machine Works, whose plant at West Rome, Ga., was destroyed by fire, will rebuild in Rome, where fire protection can be obtained.

The Security Vault & Metal Works, of Portland, Ore., contemplates building in the near future, and will be in the market from time to time for machinery.

The National Saw Co., of Newark, N. J., whose Middletown plant was damaged by fire recently, will rebuild at once.

The Marshalltown Drop Forge Co., of Marshalltown, Ia., whose incorporation is mentioned elsewhere, has begun the erection of a factory building to be 60 x 90 ft., two stories.

F. E. Myers & Bro., of Ashland, O., have just let the contract for the erection of a new foundry, 200 x 70 ft., and a combined machine shop and hardware room, 290 x 50 ft.

The Cleveland Machine & Mfg. Co. of Cleveland, will erect an addition to its factory on Hamilton street. It will be a two-story brick building, and will be erected by Geo. B. McMillan.

Kearney & Trecker, West Allis, Milwaukee, manufacturers of milling machines, are erecting a 50 x 100 ft. addition to their plant for which they have, however, already purchased the necessary machinery.

The Minneapolis Steel & Machine Co., Minneapolis, Minn., is building a one-story addition 48 x 60 ft. of brick and steel to cost $10,000 and to be used as a testing room for gas engines.

Edward B. Robertson's new machine shop at East Norwalk, Conn., is at the point of completion and will be ready for the installation of machinery at once. The new equipment will consist of 18 to 20-in. lathes, No. 2 milling machines, 24-in. drill presses and other tools.

The Semet-Solvay coke plant of the Milwaukee Coke & Gas Co., Milwaukee, Wis., is undergoing extensive improvements to cost $13,000, on completion of which the capacity of the plant in the matter of coke ovens, furnaces and other structures will be practically doubled.

The Baltimore & Ohio railroad is preparing plans for the erection of an immense terminal warehouse and cold storage plant at Pittsburg. The building, as planned, will be seven stories high and adequate to meet all demands for many years to come.

A new steel range factory is planned by the Advance Stove Works, of Evansville, Ind., as an addition to its present plant. For the erection of the new building a strip of property adjoining its premises, 75 x 170 ft., has been secured.

The New York Central will enlarge and rebuild the shops at Malone, N. Y., now that it has secured the Rutland and the New York & Ottawa railroads. Plans have already been passed upon, and the contemplated improvements call for an expenditure of $170,000.

Some Chicago capitalists are looking for a site in the Birmingham district, Alabama, for a suitable location for a plant to manufacture screws and small hardware. The plant will probably cost about $30,000, and will employ in the neighborhood of 200 men.

Ground has been broken for the building being erected by David H. Keiser, on West Penn avenue, West Reading, Pa. The structure will be one story, and 40 x 150 ft. Mr. Keiser will engage in the business of manufacturing steel office fixtures, counters, desks, filing cases and cabinets, etc. He

was formerly manager of the Wilkinson Shear Works, of West Reading.

Application has been filed by the Warner & Swasey Co., of Cleveland, for a permit to erect a new five-story building on the north side of East Prospect street near the C. & P. crossing. The building will be 54 ft. wide by 234 ft. deep and will cost $50,000. It will afford room for additional machine shop and blacksmith shop space and a new boiler will be installed.

The Newcastle Forge Co., Newcastle, Pa., recently destroyed by fire, commenced very actively last week to rebuild part of its works. The company expects to erect a modern fire proof structure made of brick and steel, 400 x 80 ft., together with a separate power machine shop, replacing such machinery as was destroyed. It is expected that the plant will be in a position to fill orders again within 30 days.

The final contract providing for the connection of the Union railroad of the Carnegie Steel Co., with the west side belt of the Wabash railroad, at Pittsburg, has been awarded and involves about $1,000,000. The general contract for grading went to Patrick Foley, of Pittsburg, and the final contract and mostly costly portion, the construction of a steel bridge over the Pittsburg, Virginia & Charleston railroad, went to the American Bridge Co.

General Industrial Notes:—

Twenty-one out of twenty-nine hot mills at the Vandegrift works of the American Sheet & Tin Plate Co., Vandegrift, Pa., will be shut down for a short time.

G. P. Truslow has sold the manufacturing plant and foundry, located on Kent avenue, Brooklyn, N. Y., to the Chrome Steel Works.

The Pottstown Iron Co., Pottstown, Pa., has leased some of its mines near Warwick, Chester county, to a New York syndicate, which will operate them. They have stood idle 15 years.

The Moorehead Bros. Rolling Mill, at Sharpsburg, has resumed operations, after an idleness of two years. The company expects to be busy on present orders for nearly a year.

Four mills of the Aetna Standard Sheet Mill plant, Wheeling, W. Va., will resume operations as soon as everything is in readiness. Sixteen of the 23 mills are now in operation.

An immense electric crane capable of lifting over 30 tons has been installed in the Scott Foundry, Reading, Pa. The crane has a span of 75 ft. in the clear and is made unusually heavy.

The Badger Steel Roofing & Corrugating Co., La Crosse, Wis., has amended its charter prescribing the duties of its officers: G. F. Sezauer, president, and E. C. Hizher, secretary.

The Eleanor Iron & Steel Co., Irwin, Pa., which had been out of operation for a great length of time and a former manufacturer of skelp and iron bars, has been sold to the Liberty National Bank of Pittsburg. The plant was mortgaged to the extent of $100,000.

The stove and furnace industry in Detroit, Mich., has undergone a very rapid growth. That city is to be credited with nine establishments which have together about $5,100,000, capital, employ in office and factory about 4,700 persons, and will have an output this year valued at $6,600,00.

The galvanizing department of the Wheeling Steel & Iron Works, at Benwood, W. Va., began operations Aug. 23. About two carloads of pipe has been turned out ready for shipment, and it is likely that a part of the plant will be kept in operation on night turn.

The William Tod Co., Youngstown, last Thursday made a shipment which attracted unusual attention. It consisted of the first of two twin tandem compound reversing engines of an entirely new type for the structural mill of the Illinois Steel Co. Each engine complete weighs 800,000 lb. and eight flat cars were necessary to ship one engine.

The Danversport Iron Works, Danversport, Mass., operated by the Sylvesta Co., of Boston, is adding to its equipment three new scrap heating furnaces, one 18-in. roughing mill, one stack, three boilers, an engine, shears, new scrap shed, etc., and will work after a shut down of about three weeks on Sept. 15. The products of the plant consist of bar iron, railroad and ship spikes, bolts, forgings, etc.

It is confidently expected that locomotive building this year will be far in excess of any recent records. A great number of railroads feeling assured of continuous prosperity have felt warranted in ordering freely for new equipment. Reliable information affords the report that all records for locomotive construction at the Baldwin Locomotive Works are to be exceeded during the year. It is almost assured that an average of 42 engines a week will have been turned out during the 12 months.

Trade Notes:—

The United States Cast Iron Pipe Co. is engaged in the removal of its Bridgeport plant to Chattanooga, Tenn.

The Lacey, Buek Iron Co., of Birmingham, Ala., recently installed an immense iron ore washer at Cedartown, Ga., which it expects to operate very shortly.

The Brooklyn Rapid Transit Co. and the Lackawanna railroad have made large purchases of machinery recently, amounting to about $20,000.

McCloud, Crane & Minter, Worcester, Mass., manufacturers of machine screws, have changed their address from Union street to 326 Chandler street, of that city.

The United Iron Works and the Iola Carriage Works, Iola, Kan., have united in the manufacture of oil tank wagons. Each will do the part for which it is equipped.

The Cincinnati Milling Machine Co., Cincinnati, O., reports a strong foreign demand and generally rushing business.

The H. A. Stocker Machinery Co. will shortly be installed in its new building at 20-22 South Clinton street, Chicago, where it will carry a complete stock of new and second-hand machinery.

The Sterling Emery Wheel Mfg. Co., Tiffin, O., has removed its Chicago salesroom from 65 to 30-32 South Canal street, fire some time ago having damaged the former location.

The Sioux Falls Plow Co., Sioux Falls, S. D., purchased the buildings and machinery formerly used by the Sioux City Plow Co., and is remodeling and renovating that equipment with the expectation of being ready to build plows in the early part of October.

The Joliet Bridge & Iron Co., mentioned in our issue of Aug. 24 as being incorporated in the state of Indiana, is the same concern which has also been operating in Illinois for the past ten years.

The Avery Stamping Co., of Cleveland, manufacturer of shovels, spades and scoops, seamless elevator buckets, and cooking utensils, has lately fitted up its tinning plant for doing all kinds of tinning and re-tinning of steel, malleable iron, brass and copper, but not cast iron, for outside parties.

The plant of the Kokomo Steel & Wire Co., which was recently damaged by a tornado, has been rapidly repaired and will soon be running again.

A new office and ware room has been opened at 622 Arch street, Philadelphia, by E. L. Fraser, representing

the Hamilton Machine Tool Co., and the Garvin Machine Co. The Hamilton Machine Tool Co. is now installed in its new building, a two-story brick structure, and has equipped its plant almost completely.

The Toledo Machine & Tool Co., Toledo, O., recently made a large shipment of forging and trimming presses for the equipment of a drop forging plant in the Pittsburg district. The company is extremely busy and is planning to build a four-story structure 50 x 100 ft.

The David Bell Engineering Works, Buffalo, N. Y., recently furnished six steam hammers to the United States Government, three of which have been shipped to Panama. This firm is devoting itself exclusively to the building of steam hammers.

The Holding Heater Co., Toledo, O., has placed on the market a gas heater which has many advantages in respect to economy, ease of handling and efficiency. The company has issued a circular, and information can be obtained by addressing the Holding Heater Co., P. O. Box 173, Toledo, O.

Among the orders secured during the week by the Chicago Pneumatic Tool Co. are the following: A large air compressor for the Isthmian Canal Commission, a complete plant, including compressors and tools for the Nippon railway, Japan, and an equipment of tools for the Kawasaki dock, also in Japan.

The C. B. Ford Co., whose incorporation was recently mentioned in *The Iron Trade Review*, purchased the property formerly leased by its predecessor and will repair and overhaul locomotives, will manufacture locomotive stock parts and the various special machines built by C. B. Ford, engineer and machinist. The company at present has two government contracts, several steam shovel contracts and is working night and day in its repair department.

The Continental Engine Co., of Chicago, builder of high speed hydro-carbon engines, has been making additions and improvements in its plant which will enable it to manufacture a new line of 30-h. p., four-cylinder engines for which is claimed special qualities. It is just about to install $5,000 worth of cylinder and crank case machinery, and is erecting a three-story factory and show room building. The company is in the market for all engine and car accessories, as well as cylinder finishing shop machinery.

The Foos Gas Engine Co., Springfield, O., through its representative, the Great Western Mfg. Co., of Kansas City and Leavenworth, Kan., has opened up an office at 107 East Fourth street, Joplin, Mo. The Foos engine can be operated on either gas or gasoline, there being a combination valve permitting the use of either explosive. At the Joplin branch the company will carry a full line of engines of all horse-power, and in addition supplies of all kinds will be kept in stock. The company's agent is E. G. Burklin.

The Pressed Steel Pole Co., Pittsburg, whose incorporation was recently mentioned, will begin the erection of its plant as soon as a decision shall have been reached regarding a location. The plant will have a capacity of 300 poles per day and will consist of a building 50 ft. wide and 200 ft. long, equipped with electric power. The plate steel is bought by this firm ready to press and is worked cold. Poles of any length up to 50 ft. may be manufactured, and the company will be ready to fill orders by Jan. 1. It is expected that these poles will be able to compete with any other kind manufactured and a splendid business is looked forward to.

Bippus & Bryan, who some time ago purchased the machinery of the Rosser & Castoe plant in Bellaire, O., will erect a new boiler plant in Wheeling, W. Va., to cost about $8,000. The buildings will be about 40 x 100 ft., and it is expected that the plant will be in operation shortly after the middle of September.

The Charles Holmes Machine Co., East Boston, Mass., mentioned in this issue as having been destroyed by fire, will rebuild at once. The new structure will be two stories in height, the lower floor being 75 x 150 ft. and the second floor 75 x 100 ft. Another two-story building, 30 x 45 ft., will also be constructed and new gas producers will be installed.

A large addition equipped with an electric traveling crane and other modern machinery is being built for the Davenport Foundry & Machine Co.'s plant, on West Fourth street, Rock Island, Ill. A second story is to be erected on the old machine shop and will be used as a pattern shop and storage room.

The Pickands-Magee Coke Co., Pittsburg, Pa., gives this information concerning the Southern Connellsville Coke Co., which was recently incorporated in Pensnylvania with $300,000 capital, all of which is paid up. The company is building 200 additional ovens, and will also build 200 more in the spring, which will make a total of 562 ovens in operation at the plant. A crusher and washer with a capacity of 1,800 tons daily is being erected, and machinery and other equipment necessary to make the plant in every way complete is being bought. It is expected that the plant will be operating satisfactorily by the first part of January, when it expects to produce a standard quality of Connellsville coke of great regularity and carrying 1 percent or under of sulphur, 10 to 12 percent ash and .012 of 1 percent phosphorus. The officials of the company are as follows: W. C. Magee, president, Pittsburg; Harry Whyel, vice president, Uniontown, Pa.; I. W. Semans, secretary and treasurer, and M. S. Simpson, superintendent, both of Uniontown.

Trade Publications.

J. L. Ingalsbe Co., Glens Falls, N. Y., is distributing literature calling attention to the peeler rasp, for horseshoers and wagon makers.

Lunkenheimer Co., Cincinnati, O., has issued a booklet describing the Lunkenheimer generator valves. These valves are intended to take the place of carburetters and are stated to be exceedingly useful and reliable.

Norman W. Henley Publishing Co., New York city, N. Y., has issued a new book catalogue relating to recently issued works on electricity, machinery, gas engines, steam engines, locomotives, automobiles, tool making, etc.

The Baker-Resek Co., Cleveland, O., have issued, under the title of "Some Talk," a pamphlet describing its products. These include a metal sawing machine, a double key lathe, and a hydraulic test pump. Prices and descriptions are included in the pamphlet.

The Lowca Engineering Co., Ltd., Whitehaven, England, has issued a catalogue describing a mechanical pig breaker and loading machinery, for use in foundry plants. A number of illustrations showing installations of this machine are also included in this book.

H. D. Smith & Co., Plantsville, Conn., have issued a catalogue describing vehicle drop forgings, special drop forgings and drop forged fine tools. The catalogue contains illustrations and descriptions of practically every forging which can be placed upon a wagon, carriage or sleigh, and also of a few tools such as cold chisels, pincers and screw drivers, etc. The book contains 140 pages and is profusely illustrated. It it bound in flexible cloth and is thoroughly indexed.